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New Frontiers

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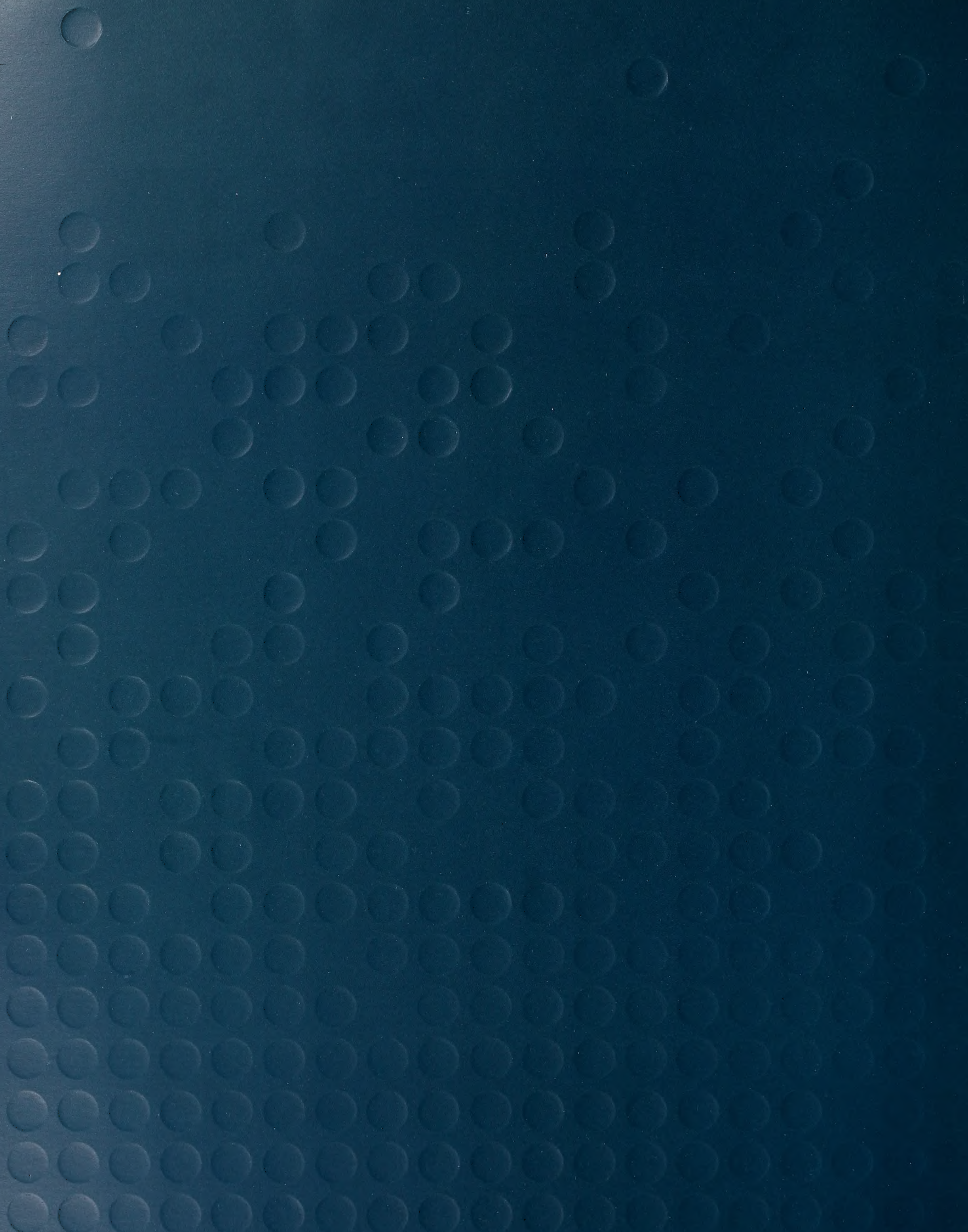

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Innovation + Initiative = Results

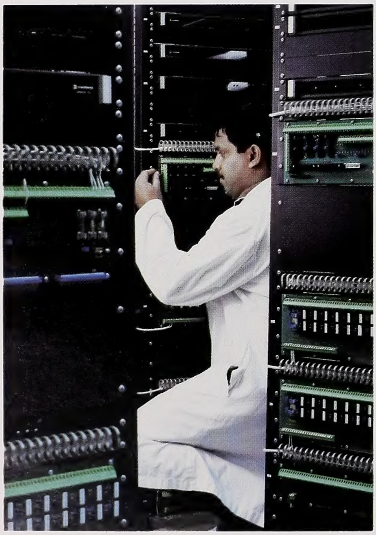
Why do some ideas become runaway business successes and others never see the light of day? It has nothing to do with chance. Innovative ideas require research, development and sound marketing strategies to succeed.

Recognizing this, the Province of Alberta is leaving nothing up to chance. Long known for innovation and initiative in the energy arena, Alberta is vigorously directing those same qualities toward diversification into the exciting frontier areas of advanced technologies. Government, industry and universities have made a unified commitment to place Alberta at the leading edge of research and development on a global scale.

The financial investment alone is substantial. Over the past five years, the Alberta government has channelled more than $700 million into research and development. Alberta's scientists are making major strides in a wide range of technologies from lasers and VLSI circuit design to cold climate construction procedures and genetic engineering. And Alberta's entrepreneurs are translating these advances into successful business ventures with worldwide market potential.

The infrastructure for development and commercialization of these exciting advances is already in place. New institutions have been created to aid the transfer of new technologies from laboratory to marketplace. Research and development parks with business incubators have been established to accommodate the needs of advanced technology companies. And responsive sources of financial assistance have been created to help turn good ideas into viable businesses.

The results are already evident. Alberta has become a magnet for entrepreneurs and companies seeking opportunities for development and global markets for their products. Their success stories are the most telling results of all.



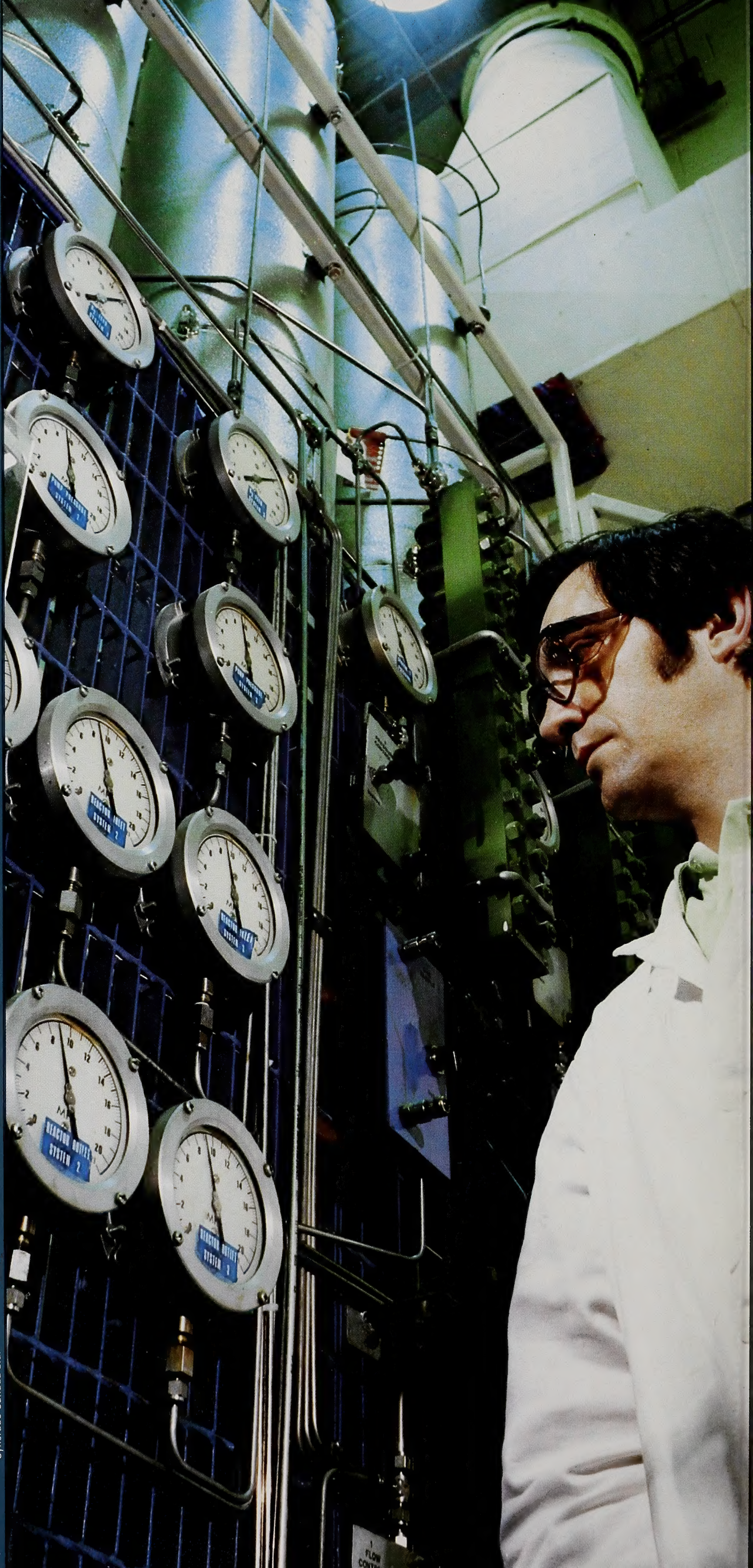
Westronic Inc.

880162

Advanced technology companies with products ranging from electronics and telecommunications to biotechnology and lasers enjoy unlimited opportunities in Alberta.

James Sew/Ladd + Associates/CHEMBIOMED

Extracting bitumen from Alberta's vast untapped oil sands was the object of some of the earliest R&D work in the province. Right: a Syncrude Canada Ltd. researcher monitors sophisticated control panels in modern-day oil sands research at the company's upgrading pilot plant.



Syncrude Canada Ltd.

R & D: Growing up with Alberta

Research and development have been part of Alberta's dynamic milieu from its very beginnings. The roots of the province's vast R&D network go back to an experimental farm established in the 1890s by the Canadian Pacific Railroad at Brooks. Today, the Horticultural Research Centre at Brooks is a major centre of research in Western Canada for all aspects of crop production. Other milestones are:

Lethbridge Experimental Farm (early 1900s)
Created by Agriculture Canada, the farm is now Canada's largest federal agricultural research station.

University of Alberta founded (1907)
The University is one of the largest universities in Canada and a major centre of forefront technology transfer ventures. It became a North American leader when in 1977 it established CHEMBIOMED Ltd., now one of the top ranking biotechnology companies in the world.

Alberta Research Council founded (1921)
ARC is the oldest and largest provincial research organization in Canada. Early work of the Council's Dr. Karl Clark led to the patenting in 1927 of a commercially viable hot water extraction process for separating bitumen from oil sands. The process is still used today by oil sands giants Syncrude Canada Ltd. and Suncor Inc. at their plants near Fort McMurray.

University of Calgary founded (1963)
The University's strong research orientation has led to the development of large concentrations of expertise in fields ranging from genetic engineering, biotechnology, and cardiovascular research to computing technologies and microelectronics.

A magnet to industry

Alberta's abundant resources and free enterprise environment have attracted industries looking for new and exciting opportunities for expansion. Industrial research in Alberta expanded rapidly in the 1950s with the establishment of laboratories in Alberta by ESSO Resources Canada Limited, CIL Inc., Sherritt Gordon Mines Limited, Dow Chemical Canada Inc. and Celanese Canada Inc.

Syncrude Canada Ltd. began its oil sands research lab in 1964. Further major expansion of industrial research occurred in the 1980s with the establishment of R & D facilities in Alberta by a number of large national and multi-national companies including Petro-Canada Inc. and Shell Canada Resources Limited, as well as Alberta-grown NovAtel Communications Ltd., TransAlta Utilities Corporation and Nova/Husky Research Corporation.

The 1980s have seen a rapid proliferation of exciting, young, home-grown Alberta companies researching and developing innovative technologies with great commercial potential.

A committed government

Research has always been a high priority of the Alberta government. In the 1970s, the government underlined it's commitment to R&D with the establishment of two major players in the province's research network:

Alberta Oil Sands Technology and Research Authority (1975)
AOSTRA was created to fund research on oil sands and tertiary recovery of conventional crude oil in industry, universities and the Alberta Research Council.

Alberta Heritage Foundation for Medical Research (1979)
AHFMR was established with an endowment of $300 million to fund new areas of basic and clinical research in Alberta's universities and hospitals.

The 1980s have seen even more dramatic developments since the Alberta government announced a firm commitment to diversify the provincial economy through development and commercialization of advanced technologies.

The **Alberta Environmental Centre** was opened in 1981 in Vegreville. About $50 million has been invested in the centre. It is Canada's first interdepartmental, interdisciplinary environmental research and service agency.

In 1984, the **Office of Coal Research and Technology** and the **Devon Coal Research Centre** were established to help Alberta's coal industry develop and implement new technologies to enhance the competitiveness and marketability of the province's coal reserves, which account for 70 percent of Canada's total deposits.

The same year, extensive research programs carried out by the Alberta Forest Service were expanded with the signing of a forestry agreement with the Canadian Forestry Service. Priorities are to assist the forest products industry in increasing productivity; to improve resource utilization; and to develop new forest products and processes, particularly those which use Alberta's abundant aspen hardwood.

The **Alberta Department of Technology, Research and Telecommunications** was formed in 1986 to spearhead the drive to diversification. The department's mandate is to encourage research, development and commercialization of innovative technologies and to work with industry and academia to create an environment in which technology-intensive industries can thrive.

The mid-1980s saw rapid advancement toward this goal with the development of an extensive R & D infrastructure. The results? The success stories in the second part of this publication speak for themselves.

Results at a Glance

- On a per capita basis, the Alberta government spends more on research and development than any of its provincial counterparts in Canada.
- In 1986-87 the government allocated an estimated $252 million to scientific activities, making it the largest single funding source in Alberta.
- Alberta is home to more than 1,200 companies which market products and services based on advanced technologies.
- Approximately 10,000 people are directly employed in Alberta's advanced technology industry.

Alberta's abundant resources and free enterprise system have been a magnet to major national and multinational companies. Below: flame spraying of nickel graphite composite powder in the Sherritt Research Centre at Fort Saskatchewan.

Sherritt Gordon Mines Limited

A wealth of resources is available in Alberta to companies seeking to commercialize innovative technologies. Teknica Resource Development Ltd., internationally known for its advanced seismic software expertise, has worked with the Alberta Research Council. Below: Teknica staff interpret seismic data using the company's revolutionary Seislog inversion process.

Teknica Resource Development Ltd

Building Blocks to Success

A solid infrastructure is essential to a dynamic advanced technology industry. The Alberta government recognized this early and took the initiative. Three key agencies — the Alberta Research Council, the Alberta Oil Sands Technology and Research Authority, and the Alberta Heritage Foundation for Medical Research — provide a solid foundation for supporting Alberta's technological advancement. As well, cooperative efforts of government, industry and the universities have created an extensive — and impressive — system of institutions providing infrastructure services. The result is a wealth of resources — from pilot plants to business incubators to venture capital funds — available for companies seeking to commercialize innovative technologies.

Alberta Research Council (ARC)

With headquarters in Edmonton and facilities in Calgary, Red Deer, Nisku and Lethbridge, ARC works closely with Alberta's universities and industrial clients to develop innovative technologies and transfer them to commercial use. Its Joint Research Venture program supports newer companies servicing Alberta's major industries and establishing export markets.

ARC provides technical advice and assistance to business and industry, while launching longer-term research in such cutting edge fields as biotechnology and computer-based advanced technologies. Other areas of research include industrial development, natural resources, energy, agriculture, forestry and forest products, transportation and environment.

ARC houses the Electronics Test Centre, a forest products testing laboratory, and a biotechnology pilot plant, among other research and testing laboratories.

Alberta Oil Sands Technology and Research Authority (AOSTRA)

Headquartered in Edmonton, AOSTRA pursues new technology for oil sands and heavy oil recovery and enhanced techniques for conventional crude oil recovery. AOSTRA's mandate is to provide the private sector and research organizations with financial incentives to develop economically viable and environmentally acceptable petroleum technology in these areas. The Authority also promotes education and training in oil sands development by funding scholarships, fellowships and professorships.

AOSTRA supports numerous experimental field projects in partnership with oil companies. An Underground Test Facility completed in 1987 provides access for underground thermal in situ recovery piloting. Other programs focus on development of specialized water treatment technologies and surface mining/extraction processes.

Alberta Heritage Foundation for Medical Research (AHFMR)

Since its creation in 1979 with a $300-million endowment from the Alberta Heritage Savings Trust Fund, the AHFMR has produced a medical research milieu unmatched anywhere in the world. The Foundation has contributed $200 million directly to the scientific community to support research in a wide variety of areas. These funds have supported 130 senior scientists recruited from Canada and around the world, trained 2,100 students and provided equipment for 275 laboratories.

Heritage Medical Scientists are pioneering advances in basic science, forefront medical technology and innovative patient care. A University of Calgary cardiac research group is pioneering ways to diagnose heart disease and a University of Alberta nuclear magnetic resonance research group is one of a handful in the world that uses this technology to diagnose and monitor cancer.

A Technology Transfer Program has also been created to provide seed capital for the development of promising scientific ideas to the stage where additional investment capital can be attracted. Grants are available to scientists and engineers in Alberta universities and Alberta-based businesses.

Alberta Laser Institute

This facility is a non-profit organization which helps industry develop more cost-effective production technology through the use of laser systems.

The Institute is the first centre in Canada oriented towards industrial application of laser technology. Emphasis is on materials processing laser sensors, electronics, and medical applications. The Institute's advanced high power laser-based metalworking machinery forms the core of one of the most modern laser materials processing centres in North America.

General Systems Research

Alberta Telecommunications Research Centre

Established in 1985 as a partnership between Bell Northern Research Ltd., the University of Alberta, and the Alberta government, this non-profit corporation has expanded to include additional corporate sponsors and works with industry on joint research and development in telecommunications. Participating industries have access to processes, systems and patents developed by the Centre. Expert assistance is available through contract research for companies wishing to develop new technologies and innovative products.

Research focuses on optical communications, with an emphasis on fibre optics and computer-aided design of microelectronic products and services.

Electronics Test Centre

The Electronics Test Centre has launched a new age in the development of the electronics industry in Alberta. The Centre provides testing and certification for electronic products, as well as product evaluation and research support for manufacturers. The services of the Centre are available to designers, manufacturers, purchasers and certification agencies, who in the past had to ship their products East for testing.

The facility, located at the Alberta Research Council in Edmonton,

L. Lorincz

A Helmholtz coil built at the Electronics Test Centre produces an homogenous magnetic field so engineers can determine the electro-magnetic susceptibility of selected medical devices.

includes laboratories for design analysis, terminal attachment testing and failure analysis, and electromagnetic interference testing using an anechoic chamber and an open field test site. It is the only such centre in Canada housing all of these components in one place.

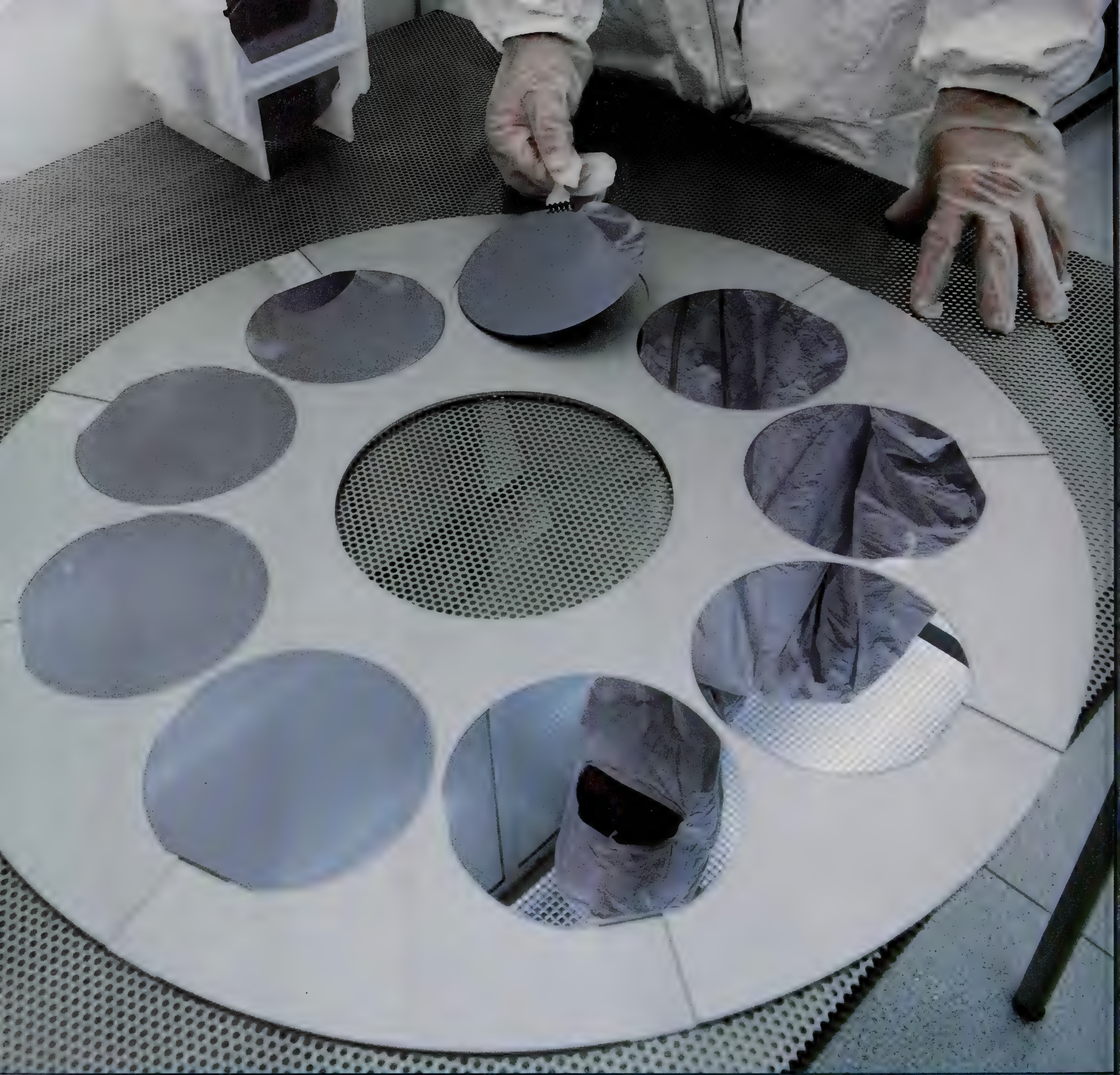
Alberta Microelectronic Centre

This non-profit corporation was established at the University of Alberta and later expanded to Calgary. The Centre assists Alberta's rapidly growing electronics industry with the application and implementation of microelectronics technology to their business.

The Centre's Edmonton Fabrication Facility, specializing in custom-designed silicon chips, is Canada's first university-based microchip manufacturing plant. It complements the Centre's Design and Engineering Application facility in Calgary. LSI Logic Canada Inc. works closely with the Centre in developing custom microchips for use in a variety of products.

Electronic Industry Information System

A pilot project through the Alberta Research Council, the System is set up to enhance the competitiveness of Alberta's electronic industry by providing the most up-to-date information available in the field. The



Alberta has established an extensive infrastructure to support its advanced technology industry. Above: The Alberta Microelectronic Centre is the only facility in the province to manufacture pure silicon wafers. Right: The Alberta Research Council's Biotechnology Pilot Plant has helped Biosis of Palo Alto, California, scale up its unique pest control technology for a $20-million production plant in the province.

System gives individual companies access to market research, competitor intelligence, applications information, business opportunities, standards regulations, software directories, component specifications, periodical indexes, patents and trademarks. It provides access to local information through its proprietary, Alberta-based data service; access to international data bases; and teleconferencing and messaging through Telecom Canada's iNET 2000 and ENVOY 100 services.

Biotechnology Pilot Plant

The Alberta Research Council's $10-million biotechnology pilot facility acts as a bridge between laboratory research and production of new products in chemical processing, agriculture and health care. The plant focuses on development of efficient processes to help companies bring their products to commercial production quickly and economically.

The pilot plant offers the only contract fermentation facility of its kind in Canada. The facility is equipped with a full range of fermentation and downstream processing equipment with volumes ranging up to 15,000 litres. The plant's facilities meet United States Federal Drug Administration Good Manufacturing Practice requirements. Serving local, national and international clients, the plant is making Alberta a major production centre for the growing biotechnology industry in North America.

L. Lorinczi

Centre for Frontier Engineering Research (C-FER)

C-FER was established to solve engineering problems particular to cold-climate energy development. Located on the University of Alberta campus, the Centre is a non-profit corporation sponsored by the Alberta government, National Research Council, the Devonian Group of Charitable Foundations, and private corporations.

C-FER's research programs in offshore structures and downhole tubular systems are designed to foster the economical development of Canada's petroleum resources on both the geographical and technological frontiers. The Centre's networking program serves as a "switchboard" for moving current technical information through Canada's frontier-related industries. The Centre works closely with industry in planning research programs and in carrying out contracted projects.

Supercomputer Centre

The University of Calgary's CDC Cyber 205 is the only supercomputer in Western Canada available to industry. It is the heart of a supercomputing technology centre which is a joint venture of the Alberta government, the University and Control Data Canada Ltd. The Centre encourages research and training in vector computing technology, developing state-of-the-art supercomputer application software and attracting world class academic and industrial research to Alberta.

Industry and universities have access to the supercomputer through an Alberta government program which reserves computer time and offers it on a grant basis for commercially viable research and development projects.

Canadian Centre for Learning Systems (CCLS)

CCLS is a non-profit organization located in Calgary and owned by a consortium of Alberta educational institutions and local and national corporations. The company performs research, development, evaluation, teaching and training in all areas of computer-assisted learning and provides industry with access to state-of-the-art information and technology in the field.

The Centre works under contract to

help develop Canadian software for specific needs and works with companies in such areas as developing computer assisted learning training programs.

Food Processing Development Centre

Under the wing of Alberta Agriculture, the Food Processing Development Centre in Leduc helps increase the competitiveness of Alberta's food processors through application of new technology and development of new products and processes.

The Centre provides the food processing industry with assistance and trouble-shooting in product and process development. The facility includes a federal health of animals registered processing plant area, a product development and evaluation laboratory and a comprehensive information service centre. Services are provided free of charge.

Other Support Services

Business Incubators

The success rate for new businesses can be improved by as much as 60 per cent in an incubator setting. Recognizing this, the Alberta government offers financial support for the development of business incubators which provide such services

L. Lorincz

Alberta Research Council headquarters in Edmonton houses the Electronics Test Centre, a forest products testing laboratory, and a biotechnology pilot plant, among other research and testing facilities.

as shared administrative support, business counselling assistance, management training and access to seed capital.

Construction began in 1987 on two major multi-tenant research facilities:

- **Discovery Place I,** a project of the Calgary Research and Development Authority; and
- **Edmonton Advanced Technology Centre,** a project of the Edmonton Research and Development Park Authority.

Four other incubators, including the highly successful **Calgary Advanced Technology Centre,** operate in the province, and numerous others are in the planning stages.

Research and Development Parks

Both Edmonton and Calgary have outstanding research parks offering a stimulating environment for advanced technology activity:

- **Edmonton Research and Development Park,** adjacent to the headquarters and laboratories of Alberta Research Council;
- **Calgary Research and Development Park,** located northwest of the University of Calgary;
- **University Research Park,** adjacent to the University of Calgary.

Financial Initiatives

Good ideas need responsive sources of capital to be transformed into viable businesses. Sensitive to this need, the Alberta government has launched a variety of financial initiatives to encourage businesses to develop innovative technologies and products.

- **Vencap Equities Ltd.** is a $244-million venture capital fund established with a loan from the Alberta Heritage Savings Trust Fund and public sale of shares. Vencap invests in Alberta companies with substantial growth prospects and the potential to further diversify the Alberta economy.

- **Alta-Can Telecom Inc.,** a subsidiary of Alberta Government Telephones, invests in private sector ventures in microelectronics and telecommunications. The company also offers assistance in manufacturing goods with international marketing potential.

- **Alberta Opportunity Company,** a crown corporation, offers management and financial assistance in the form of equity, loans or loan guarantees to Alberta small businesses, often in rural areas where conventional financing is not readily available.

- **Small Business Equity Corporation Program (SBEC)** is designed to stimulate the formation of privately managed pools of equity capital to invest in eligible small businesses. SBECs offer attractive incentives to investors in the form of grants for individuals and refundable tax credits for corporations.

- **Small Business Term Assistance Plan** offers fixed-rate loans for up to a ten-year term to shield businesses from fluctuating interest rates and allow for stabilized long-range financial planning.

- **SPURT Investment Fund I** is a private/public sector initiative designed to support emerging high-tech companies with equity investments at the high-risk conceptual, research or prototype stage of development.

The laboratories of Alberta's universities have been the starting point of many important technological advances and successful technology transfers.

James Sew/Biomira Inc.

Pushing Back the Frontiers

The starting point of great technological advances is often the university laboratory. In disciplines as far ranging as laser technology and genetic engineering, Alberta's scientists are leaders in their fields.

Alberta's major universities have aggressive technology transfer programs. And their scientists welcome opportunities to work closely with industry to develop innovative technologies with commercial potential.

University of Alberta

The University of Alberta is developing a position of leadership in technology transfer.

Many new products such as lasers, biologicals and pharmaceuticals emerge from and remain linked to university research programs. Transfer of these technologies is made possible through patents, licences, contract arrangements, joint ventures, university enterprises, and a range of industry-university interactions. Contract research during 1986-87 amounted to $5.7 million.

The University started CHEMBIOMED Ltd., one of the leading biotechnology companies in the world. It now holds equity in Majestic Laser Systems, a joint venture to market high power laser technology developed in the University's laser laboratory; and Biomira, a company set up to develop monoclonal antibodies for cancer diagnosis and therapy, based on the work of two University of Alberta professors. University researchers have also formed four separately incorporated pharmaceutical companies.

Five of the major faculties — Medicine, Pharmacy, Engineering, Science, and Agriculture and Forestry — are the main focus for technology transfer activities involving leading edge research. In addition, the Faculty of Business, together with the Management Advisory Institute, assists businesses and inventors in the development of business strategies.

Health sciences research has been greatly expanded in the past six years due in large part to support of the Alberta Heritage Foundation for Medical Research. Research in this area accounts for nearly half of total sponsored research on campus. Strong financial support and the atmosphere of growth are attracting leading scholars from around the world. Collaboration amongst the Faculties of Science, Pharmacy, Dentistry and Medicine is causing more basic science to transfer to clinical medicine where research can be applied to patient care. One leading researcher is working on the development of new and better prosthetic devices and methods for electronically activating nerves in paraplegics. Another important development is the innovative medical laser which will be marketed worldwide for use in removing cancerous tumors without burning surrounding tissue.

The Faculty of Engineering has been instrumental in creating new industrial research centres for electronic, telecommunication, laser and energy production technologies. These centres operate independently and are supported directly by industry and government. The Faculty also has numerous industrial contracts for civil, process control and cold climate research.

The Faculty of Science covers a wide spectrum of disciplines related to the natural resource, computer, health, chemical, and other industries. Leading edge research involves such areas as detection of seismic events, use of microbes to clean up industrial wastes, genetic engineering of native plant species, and biosynthesis of antibiotics.

In Agriculture and Forestry, a new Biotechnology Centre in Plant Science, headed by a world renowned biochemist, was established with industry support. A versatile food processing pilot plant provides opportunities for research with industrial applications. One of the new technologies being licensed is a synthetic potato skin for the fast food and institutional food industries.

University of Calgary

Because of the calibre of its research staff, the University of Calgary's Faculty of Medicine attracts the highest per capita research funding of all Canadian university medical facilities. The faculty has the highest concentration of reproductive physiologists and one of the largest concentrations of expertise in genetic engineering and biotechnology in Canada. The group has worked closely for many years with Alberta Livestock Transplants Ltd., the first company in the world to specialize in embryo transfer. The Faculty's Regional DNA Synthesis Laboratory serves all of Western Canada; its Protein Engineering Laboratory provides custom peptide synthesis.

The University's Cardiovascular Research Group is one of the few in North America to cover the spectrum from laboratory study of single heart cells to clinical research with cardiac patients.

The institution has extensive modern computer facilities including one of Canada's very few supercomputers. The University's research in microelectronics is strongly oriented to industrial and commercial needs, spanning the full range from design through application.

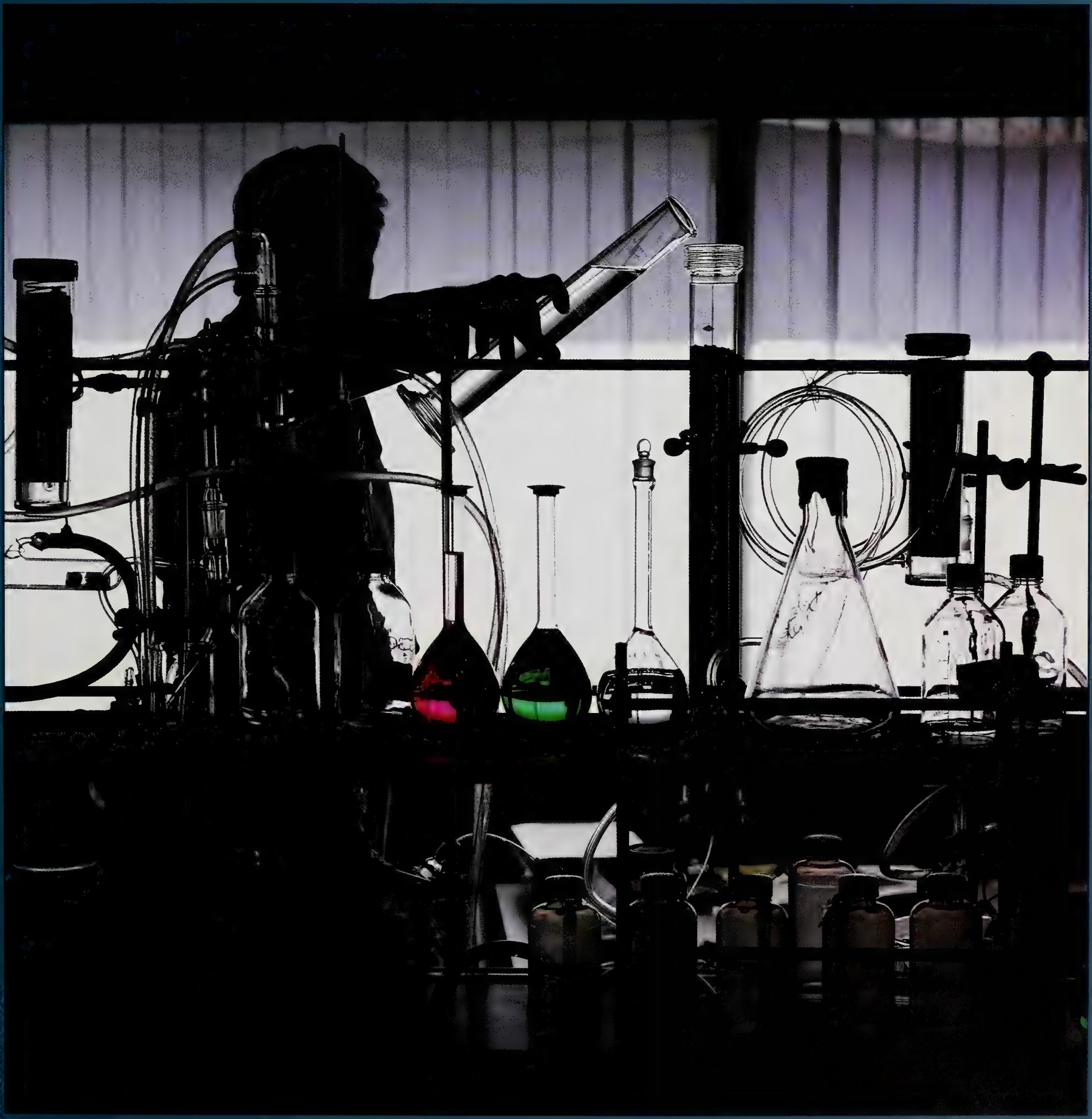
The University of Calgary is widely recognized for its oil and gas expertise. Much of its research in this area has translated into commercially viable products, processes and techniques.

The University has gained a strong reputation, particularly in the United States and Europe, for its work in exploration geology and geophysics. A large part of this research is funded by the Canadian oil and gas industry. Because of the University's close working relationship with the industry, its particular strengths and interests often parallel or lead current industry concerns.

Important research initiatives in chemical engineering, satellite navigational systems, and digital mapping have led to newly funded research projects.

The Department of Chemical and Petroleum Engineering is at the forefront of software development for computerized reservoir simulation. The Computer Modelling Group, an industry-sponsored affiliate of the University, was a spin-off from this work and is today a leader in reservoir simulation and modelling.

Alberta's universities work closely with industry. Below: University of Alberta research programs are linked to many new products, including biologicals and pharmaceuticals. Left: Pre-purchased time on the University of Calgary's powerful Cyber 205 supercomputer is available to Alberta industry on a grant basis from the Government of Alberta.



James Sew/Bionura Inc

Other oil and gas research related affiliates are:

- **Petroleum Recovery Institute,** which focuses on improving hydrocarbon recovery techniques;
- **Arctic Institute of North America,** which has developed an automated bibliographic database of information relating to all aspects of the north; and
- **Alberta Sulphur Research Ltd.,** a non-profit agency supported by member companies to serve as a research and training bridge between university and industry.

University of Lethbridge

Advanced technology research at the University of Lethbridge will have impact in fields ranging from agriculture to astrophysics.

Exciting developments in infra-red spectrophotometry, detection, recording and analysis have led to major improvements in sensitivity and accuracy of instrumentation with potential applications in industry and medicine.

Other work, on the development and control of gibrillin activity in plant growth, promises to have major implications for the control of plant height and yield.

Both theoretical and applied studies are being done in the field of surfaces, involving definition of properties and chemical reaction.

Bill McKeown/Westfile

The University of Calgary is home to a number of industry-sponsored research affiliates. Alberta Sulphur Research Ltd. serves as a training bridge between the university and the province's substantial sulphur industry.

TECHciting Alberta: The Obvious Choice

Rapidly advancing technologies create a multitude of opportunities almost daily for the entrepreneur. The challenge is to pick a winner for all the right reasons. The choice is obvious. Alberta is the **tech**citing place to be, now and in the future. Here's why.

A Dynamic Economy

Buoyed by a strong free enterprise philosophy and stable political system, Alberta's economy has grown at an average annual rate of almost 13 per cent since 1975. Alberta's Gross Domestic Product in 1985 was $62 billion, which translated into the highest per capita of any province in Canada.

In 1985, with 9.3 per cent of Canada's population, Alberta accounted for about 13 per cent of Canada's total domestic production, demonstrating the confidence investors have in the future strength of the Alberta economy. Alberta has made a major commitment to economic diversification with particular emphasis on advanced technologies. Through the Department of Technology, Research and Telecommunications, the government has helped to create a technologically rich environment which has already accelerated the growth of the advanced technology sector.

Skilled Labor Force

Alberta has a young, skilled work force, trained at the province's four universities, its community colleges and technical institutes. The province enjoys a participation rate of 71.9 per cent, the highest of any Canadian province. The number of person-days lost in Alberta due to strike action is well below the Canadian average.

Links to World Markets

Alberta is well-connected to its world markets through a modern network of road, rail, air and pipeline facilities. Efficient, low-cost intermodal facilities are located in Edmonton and Calgary with excellent highway feeder services from other areas of the province. Initiatives are underway to create additional intermodal transportation services.

The province has particularly well-established trade links with the United States and countries in the Pacific Rim. Overseas markets are accessed primarily through the ports of Vancouver and Prince Rupert in British Columbia, the port of Thunder Bay on Lake Superior, and the Port of Montreal in Quebec.

Incentives

Investors seeking opportunities in emerging technologies will find in Alberta an extensive system of incentives, both financial and practical. A variety of financial incentives ranges from direct financial support, through purchase of preferred shares or loan guarantees, to special funds providing small business loans, venture and risk capital, and tax incentives for investors in Alberta companies. A number of government agencies are prepared to assist in selecting industrial sites, starting or expanding production, developing products or processes, developing markets, and accessing technical information.

Appealing Lifestyle

Alberta combines the serenity of the Rocky Mountains and northern wilderness with the excitement of industrial progress and modern metropolitan lifestyle. Few places in the world can match the quality of life and prosperity enjoyed by Albertans.

The government health plan guarantees basic health coverage for all citizens. Basic education to Grade 12 is available to all children at no charge, while realistic fees are charged for higher education and adult retraining courses.

Alberta is the only province in Canada that does not levy a sales tax.

Legislation ensures that Albertans will continue to enjoy quality of environment and vast unspoiled natural areas. Albertans enjoy a vigorous artistic and cultural milieu against a diverse ethno-cultural backdrop.

Don't you belong here in TECHciting Alberta?

Let's get together. For more information, contact:
Alberta Technology, Research and Telecommunications
12th Floor, Pacific Plaza
10909 Jasper Avenue
Edmonton, Alberta
Canada T5J 3M8
Telephone: (403) 422-0567
Fax: 420-1474
Telex: 037-42687

Few places in the world can match the quality of life enjoyed by Albertans. Below: The Rocky Mountains provide a superb backdrop for outdoor recreation. Left: A government-initiated, privately owned intermodal system has cut shipping costs 30 percent.

Alberta Success Stories

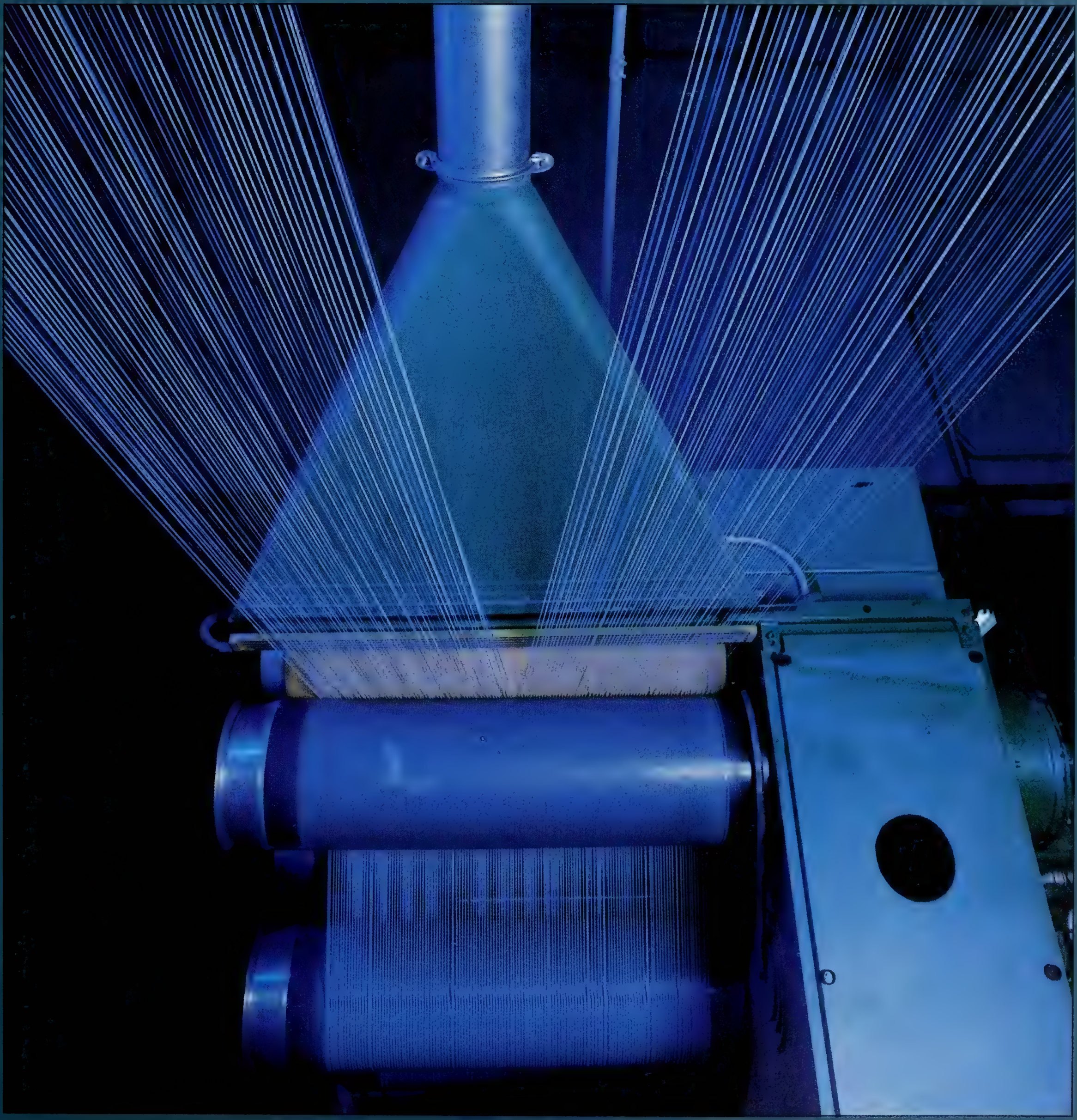
Alberta offers advanced technology companies large and small a unique opportunity to write their own success stories.

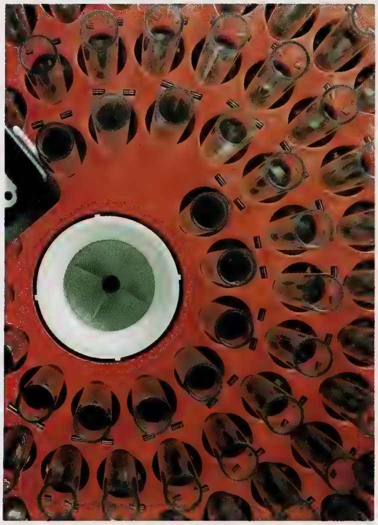
The province has long been favored as a regional or head office location for large national and multi-national companies. In recent years, Alberta's aggressive moves toward economic diversification, have created a dynamic climate in which more than 1,200 "home grown" advanced technology companies have taken root and flourished. Today these companies export their innovative products and services around the world.

These "success stories" point to the exciting opportunities in Alberta for investors and entrepreneurs who are ready to step into the future as part of Alberta's thriving advanced technology industry. This list is in no way exhaustive. Rather, it illustrates the wide range of technology and expertise at work in Alberta today.

Success breeds more success. Shouldn't your company be here?

More than 1,200 advanced technology companies have written their own success stories in Alberta. One of these is Novatex Manufacturing Canada Ltd., which has developed a unique circular loom that weaves plastic bag and sheet products for industrial uses.





Companies are identified by product and technology according to the following legend:

- ⬛ Advanced Engineering
- 🟦 Advanced Materials and Processing
- 🟨 Biotechnology
- 🟪 Chemicals/Pharmaceuticals
- 🟩 Computers and Software
- 🟧 Electronics
- 🟥 Medical Products/Health Care
- 🔵 Telecommunications

A

ACT Computer Services Ltd.
11735 - 170 Street
Edmonton, Alberta
T5M 3W7
(403) 451-5555 🟩

ACT Computer Services Ltd. is an Alberta-based and Alberta-owned company with more than 150 data processing professionals whose expertise spans the full spectrum of information technology.

Established in 1971, ACT has been successful in the development and implementation of large information systems for heavy equipment dealer management, inventory control, fleet management and information retrieval. ACT's experience in the effective application of technology to meet specified business objectives has resulted in contracts in more than 100 cities on five continents.

Alphatel Videotex Directories Limited
11430 - 168 Street
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T5M 3T9
(403) 452-6555 🟩 🔵

West Edmonton Mall, the world's largest enclosed shopping centre, with more than 800 stores and services housed in five million square feet, provided the ideal testing environment for CADIS, a second generation computer advertising and directory information system developed by Alphatel Videotex. The 100 per cent Alberta-owned company has installed 20 terminals in the shopping complex. The system has been used by over two million shoppers who have made 12 million information inquiries.

First tested in 1983, CADIS has evolved to become a specialized public access videotex system whose terminals incorporate special function keyboards and a unique dual screen configuration. The system allows users to request information by alphabetical or categorical listing and then to request more detailed information. The system is an easy-to-use "electronic yellow pages". Other applications include city guide/tourist information systems, hotels, point-of-sale couponing systems for supermarkets, other retail outlets, real estate companies and integration with existing text databases requiring visual information

Alphatel is experienced in all aspects of database design, computer graphics production and electronic directory systems management and maintenance.

Alta Genetics Inc.
Site 12, Box 12
R.R. 4
Calgary, Alberta
T2M 4L4
(403) 239-8882 🟨

Specialized facilities, elite livestock genetics, a highly qualified research and production team and innovative technology make Alta Genetics unique in Canada and perhaps in the world.

The newly formed biotechnical company, specializing in cattle breeding by the most advanced embryo transplantation techniques available, is focusing on a worldwide market for its cattle genetics. At the same time, it is committed to servicing the cattle industry through new ideas and techniques to benefit cattle breeding.

Located on the outskirts of Calgary, company headquarters contain the Alta Genetics Production Unit, which houses a modern embryo transfer facility suited to non-surgical and surgical embryo collection and transplantation. The adjoining Alta Genetics Research Unit has facilities for embryological research in **in vitro** fertilization and parthenogenesis of ova, embryo sexing and gene injection, and nuclear transplantation.

Alta Genetics is an affiliated company of Alberta Livestock Transplants and Altamira Capital Corporation. Established in 1971, Alberta Livestock Transplants was the first company in the world to commercialize and specialize in bovine embryo manipulation and transplant technology, as well as bovine genetics.

Arctec Canada Limited
#16, 6325 - 11 Street S.E.
Calgary, Alberta
T2H 2L6
(403) 253-4883 ■

Development of isolated regions with harsh environments creates unique challenges which, for more than a decade, have been met by Arctec Canada Limited. A Canadian controlled company offering applied research in support of the transportation, resource/energy and electronics sectors, Arctec has initiated several innovative projects in laboratories at Calgary, in Kanata, Ontario, and through a St. John's, Newfoundland, subsidiary.

Its marine research division, headquartered in Calgary, develops and tests ships and offshore structures for arctic and sub-arctic environments. Acknowledged as a world leader in advanced engineering and marine transportation R&D, the firm has been heavily involved in ship trials and general application instrumentation in a hostile environment. Arctec has tested virtually all Canadian icebreakers and offshore Beaufort Sea structures built in the last dozen years.

The Calgary office also serves as a centre of excellence for "hostile environment instrumentation", taking on different monitoring jobs in short time frames.

B

Baker Electronic Enterprises Inc.
9640 - 27 Avenue
Edmonton, Alberta
T6N 1B2
(403) 450-4924 🟧

Baker Electronic Enterprises Inc. (formerly Baker Engineering Enterprises Limited) designs and manufactures electronic products for the agriculture industry including livestock control products, function monitors for mobile farm machinery, and custom-designed electronic controls for grain handling and processing plants.

Baker's research and development emphasizes new technologies for monitoring and programmed control of fertilizer, seed and chemical application monitors. Understanding the market and its end users, Baker can develop viable solutions through systematic application of electronic technology, design, engineering and manufacturing capability.

Biomira Inc.
Edmonton Research &
Development Park
Edmonton, Alberta
T6N 1E5
(403) 450-3761 🟨 🟥

Incorporated in 1985, Biomira Inc. was formed to commercialize technology developed by University of Alberta researchers Dr. B.M. Longnecker, an immunologist, and Dr. A.A. Noujaim, a radio pharmacist. Based on a continuing flow of cancer-related technology through formal agreement with the University of Alberta, the company develops, produces and markets medical diagnostic and therapeutic products for use in the fight against cancer.

Using its expertise in manipulating the immune system with synthetic carbohydrate antigens, Biomira believes it can develop superior monoclonal antibodies which consistently recognize and bind to malignant cells and not to normal cells. Additionally the company is testing ways in which synthetic carbohydrate antigens can be used in immuno therapy products.

Biomira recently raised $15 million in its initial public offering and is currently listed on the Toronto, Alberta and Montreal stock exchanges.

BIOSIS
c/o Alberta Research Council
Biotechnology Pilot Plant
P.O. Box 8330, Postal Station F
Edmonton, Alberta
T6H 5X2
(403) 450-5305 🟨

Scale-up capability offered by the Alberta Research Council's newly expanded biotechnology pilot plant was a major factor in attracting BIOSIS to Alberta. A biological pest control company headquartered in Palo Alto, California, BIOSIS has signed an agreement which will see ARC scientists scale-up technology developed by the company for growing entomogenous nematodes (tiny insect-killing organisms) in liquid culture.

Parasites of harmful insects such as worms, grubs and beetles, the nematodes are harmless to humans. These qualities make them ideal weapons in the biological control of insects which annually cause billions of dollars worth of damage to food crops, lawns and greenhouse plants.

BioTechnica Canada Inc.
170, 6815 - 8 Street N.E.
Calgary, Alberta
T2E 7H7
(403) 295-0383 🟨

BioTechnica Canada Inc. is the third in a group of biotechnology companies which includes BioTechnica International of Cambridge, Massachusetts, and BIOTAL Limited of Cardiff, Wales. Launched in 1985 with the commitment of a $12-million investment by Vencap Equities Alberta Ltd., BTC is the largest biotechnology company in Western Canada. The company develops and applies advanced biotchnology for the improvement of oil seeds, cereals and forage crops and microbial inoculants for the agricultural industry in Alberta and Western Canada. Future projects will focus on development of new products and processes for the forestry and energy industries.

In its first major commercial venture, BTC will be investing up to $8 million in a research and development project to develop varieties of hybrid canola tolerant to specific herbicides. Other opportunities include a microbial inoculant that improves the quality of silage through an enhanced fermentation process, specialized inoculants for alfalfa silage and tame hay, varieties of edible oil flaxseed, and specialty flour from cereal grains.

C

Canada Systems Group
2912 Memorial Drive S.E.
Calgary, Alberta
T2A 6R1
(403) 248-4440 🟩

As a leading North American supplier of information technology services and products, Canada Systems Group Ltd. (CSG) has a broad range of industrial and government clients for its computer-based services.

Launched in Ontario in 1971, the firm established an Alberta presence in 1975 and in 1980 opened the Western Region Processing Centre in Calgary.

Operating with an Amdahl 470-V8, a broad range of peripheral equipment, and a high-speed printing capability, the centre offers general processing services along with specialized applications for the oil and gas industry, educational programs, and a variety of communications and technical services. With a large centralized software staff, the western region operation develops, installs and maintains operating systems, teleprocessing monitors, data base managers and specialized proprietary software.

Canadian Foremost Ltd.
1616 Meridian Road N.E.
Calgary, Alberta
T2A 2P1
(403) 272-3322 ⬛

Canadian Foremost Ltd. specializes in the design, manufacture and marketing of high-mobility all-terrain vehicles and hydraulic oilfield pumping systems.

The company's research and development program has been one of its most consistent contributors to success. In 1976, for example, Foremost began development of the HEP pumping system. A highly flexible and reliable alternative to conventional pumping systems, HEP has become a leader in sophisticated oilfield pumping technology.

The company also continues its commitment to R&D vehicle projects, integrating new technology, improving existing products and expanding vehicle designs and applications.

Canadian Foremost was the first company to sign a cooperative agreement with the Soviet Union to manufacture two prototype all-terrain vehicles.

Canadian Fracmaster Ltd.
800, 300 - 5 Avenue S.W.
Calgary, Alberta
T2P 3C4
(403) 264-8700 ⬛

Canadian Fracmaster Ltd. was founded in 1976 to provide oil and gas well stimulation and cementing services to the petroleum industry. The company operates in Alberta, Saskatchewan, British Columbia and the North Slope of Alaska and has the largest Canadian research and development staff of the major oilfield service companies active in Canada.

Reflecting its efforts in developing new technology, Fracmaster was named a finalist in both the innovation and invention categories of the 1986 Canada Awards for Excellence, sponsored by the federal department of regional industrial expansion. The products involved a specially designed coil tubing unit for work in the Arctic and a sand-fracturing technique using 100 per cent liquid carbon dioxide as the carrying fluid.

In 1987, the company won a contract to supply $6-million worth of high pressure pumping equipment for fracturing and acidizing the Astrakhan II gas development project in the Soviet Union.

Canadian Offshore Group
3640 Dartmouth Road S.E.
Calgary, Alberta
T2G 4A6
(403) 243-6775 🟦 🟨

Canadian Offshore Group is the tradestyle of Canadian Offshore International Marketing Inc. The company was founded in 1979 and has expanded to include other divisions: Linco Enclosures, Linco Medical and Canadian Offshore Safety Technology and Services.

The company manufactures and distributes telecommunications, electronics and instruments for harsh environments including marine, hazardous area and industrial locations.

Linco Enclosures manufactures industrial cabinets, enclosures, instrumentation panels and rack mounts for electronics, communications and control or instrumentation equipment.

Linco Medical manufactures and distributes the ARC-8 Auditory Response Cradle, designed for testing the hearing capability of newborn (neonate) children.

The company has completed sales and projects in Algeria, Japan, U.S.S.R. and Europe.

James Sew/Ladd + Associates

Canterra Energy Ltd.
P.O. Box 1051
Calgary, Alberta
T2P 2K7
(403) 267-9111 ■

A subsidiary of Canada Development Corporation, Canterra is active in exploring for and producing and marketing oil and gas and is the largest marketer and second largest producer of sulphur in Canada.

The company sponsors research programs of such organizations as Alberta Sulphur Research Ltd., the Petroleum Recovery Institute, the Computer Modelling Group, C-CORE (Centre of Cold Ocean Resource Engineering — Memorial University in Newfoundland) and C-FER (Centre for Frontier Engineering Research) and is participating with the Alberta Oil Sands Technology and Research Authority in developing technology in the Athabasca oil sands deposit.

Caulfield Engineering
193 East Whitecroft
52313 Range Road, 232
Sherwood Park, Alberta
T8B 1B7
(403) 955-7290 🟩 🟨

Caulfield Engineering brings together such diverse disciplines as oceanography, physics, chemistry, geology, engineering systems analysis, programming and administration. An outgrowth of Caulfield Creative Arts Ltd., formed in 1975 to exploit the potential of applying computer technology to the hobby music business, Caulfield Engineering manufactures ship speed log equipment, correlation sonar equipment, stereo side scan sonar equipment, marine and land shallow sub bottom data equipment, custom microprocessors for navigation systems, special sensors, lasers and signal processors. The firm is also involved in low temperature computer developments and in the interface of laser sensors with computers.

Manufacturing to customers' specifications, the firm uses a comprehensive inventory of oceanographic and electronic test equipment to supply clients ranging from major resource companies to the United States and Canadian governments.

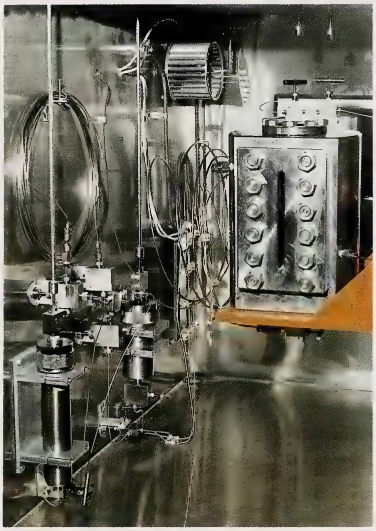
Champ Armstrong Communications Inc.
#5, 2010 - 30 Avenue N.E.
Calgary, Alberta
T2E 7K9
(403) 250-3202 🟦 🟧

This young Calgary company specializes in design, manufacture and sale of RF (Radio Frequency) technology for civil aerospace markets. Champ has a unique capability in leading edge SMD (Surface Mounted Device) technology. While its earliest customers are local industries, Champ is targeting its product at government and large military industries in the United States, Europe and Canada. The company also designs, manufactures and sells aircraft strobe lighting to the United States market.

CHEMBIOMED Ltd.
Edmonton Research
and Development Park
P.O. Box 8050
Edmonton, Alberta
T6H 4N9
(403) 450-6800 🟨 🟥

CHEMBIOMED Ltd. is an Edmonton-based biotechnology company established in 1977 by the University of Alberta to commercialize the research of University scientist Raymond U. Lemieux. The company is currently owned by the Alberta government. A public share offering will be made in the near future.

The firm has developed a major line of monoclonal antibody-based blood diagnostic products as well as a novel line of products used to purify blood fractions. These products are now sold in Europe, the United States, Canada and Japan. These products are based on the world's largest library of synthetic carbohydrate antigens, developed by CHEMBIOMED during



D B Robinson and Associates Ltd

more than a decade of focused research. With its affinity purified monoclonal antibody products the company is recognized as being in a strong position to conduct first-class collaborative research and development with the major players in the burgeoning biotechnology/ pharmaceutical industry worldwide.

The company's R & D focuses on new products for cancer diagnostics and therapeutics, and diagnosis and treatment of autoimmune disorders, blood disorders and infectious diseases.

Clinical research using BIOSYNSORB™ immunoadsorbent cartridges is highly advanced in the areas of bone marrow and kidney transplantation across the ABO blood group barrier. Extensions are planned for heart and other organs. An injectable form of synthetic blood group oligosaccharides is being investigated particularly for treating hemolytic disease of the newborn and transfusion reactions.

CHEMBIOMED recently consolidated its research laboratories, production facilities and administration offices in a new $12-million research facility in the Edmonton Research and Development Park.

Circa Telecommunications Inc.
7210G - 5th Street S.E.
Calgary, Alberta
T2H 2L9
(403) 258-2011 🟦

Founded in 1985, this company specializes in the development and manufacture of protection and distribution devices, such as lightning arresters and electrical surge protectors, for the telecommunications industry. Circa has created a niche market for itself by designing its products to accommodate customer modifications to meet the needs of individual telephone companies. Among its customers are major telephone companies in Western Canada and several in the United States.

Computer Modelling Group
University Research Park
3512 - 33 Street N.W.
Calgary, Alberta
T2L 2A6
(403) 282-9286 🟩

The Computer Modelling Group is recognized worldwide for its expertise in petroleum reservoir simulation. Through extensive research and development, and cooperation with multinational oil companies, CMG has evolved simulation technologies for black oil, compositional, steam, combustion, chemical and additives, and phase behavior. These simulators are suitable for micro, mainframe and supercomputers.

Located in Calgary's University Research Park, CMG was founded in 1977. CMG is a membership organization, in which members participate to jointly share and develop reservoir simulators. Members are entitled to receive all of the technologies and research findings from participating in CMG. CMG currently has more than 35 members, including many of the world's leading petroleum companies and institutions. Member companies may take advantage of research provided by the group's team of engineers and scientists, and use CMG's reservoir and engineering expertise to extend their knowledge base.

Cool Grain Drying Systems Inc.
#5, 2010 - 30 Avenue N.E.
Calgary, Alberta
T2E 7K9
(403) 250-8882 🟧

This four-year-old Calgary company was the first on the market with a sophisticated grain bin monitoring system based on integrated circuit technology. The company worked with the Alberta Research Council to access the technology that would be required to produce a practical and competitive sensor system to detect heat build-up in graineries. As a result, Cool Bin was the first company in North America to develop such a system to a marketable level. The company has 15 employees and markets its product throughout Canada and the United States.

Core Laboratories Canada Ltd.
1540 - 25 Avenue N.E.
Calgary, Alberta
T2E 7R2
(403) 250-5600 ⬛ 🟩

Core Laboratories has marked a half century of operation in Alberta, primarily servicing the oil patch with laboratory analyses, engineering and field services related to measuring and interpreting rock and fluid properties.

Core Laboratories recently joined forces with Atlas Wireline Services and Western Geophysical to create Western Atlas Canada Ltd. Although each of the companies will retain its corporate identity, the combination of resources and technical expertise has the potential for creating synergistic solutions to meet challenges in the search for energy.

Core Laboratories continues to set the industry standard in analytical techniques. Recent innovations include:

- development of specialized equipment to measure rock properties automatically under overburden and Klinkenberg flow conditions;
- the first commercial industrial use of computed tomography (CT Scanning);
- an electromagnetic goniometer to quantitatively measure core fracture data;
- Select™, a software package designed for personal computers that performs graphical and statistical analysis on measured data;
- AutoSwab™, a self triggering gas lift designed to replace pumping equipment for marginal oil wells;
- Automated Acoustic Well Sounder for pressure transient analysis.

Core Laboratories has labs in Calgary, Edmonton and Estevan, Saskatchewan, and employs approximately 130 people.

Cyberscope Industries Inc.
4906 - 75 Avenue
Edmonton, Alberta
T6B 2X8
(403) 468-2023 🟧

An affiliate of Russell Ultrasound Services (NDT) Ltd., an Edmonton firm specializing in non-destructive testing and instrumentation, Cyberscope was formed to translate an existing theory into an efficient testing tool with a wide range of industrial applications. The result is a revolutionary inspection method for carbon steel piping and tubing.

The Cyberscope-developed remote field eddy current probe solves the problem of induced magnetic interference, which once limited the use of electromagnetic inspection techniques to materials such as copper, brass and aluminum.

Since the majority of heat exchangers are now made of carbon steel, the probe is seen as filling a major gap in technology and is expected to find wide acceptance in the oil industry, pulp mills, thermal power plants, chemical complexes and the military.

Cyberscope has also undertaken research in the field of ultrasonic immersion tank testing and inspection technology for buried pipelines.

D

D.B. Robinson & Associates Ltd.
9419 - 20 Avenue
Edmonton, Alberta
T6N 1E5
(403) 463-8638 🟩 ⬛

A research-intensive operation, D.B. Robinson & Associates Ltd. serves the fluid property needs of oil and gas-related industries internationally. Located in the Edmonton Research & Development Park, the company

- develops and markets computer software for predicting the properties and behavior of natural gas, oil and related materials;
- develops technology to experimentally measure the behavior of gases and liquids encountered in oil and gas production and processing; and
- designs, manufactures and markets specialized equipment such as high pressure pumps, cells and related devices for use in operating experimental laboratories.

Company founder Don Robinson, professor emeritus of chemical engineering at the University of Alberta, has been a recipient of numerous Canadian and international awards in recognition of his achievements in the measurement and prediction of the properties and behavior of hydrocarbons and related mixtures.

D & S Petroleum Consulting Group Ltd.
700 Palliser Square One
125 - 9 Avenue S.E.
Calgary, Alberta
T2G 0P6
(403) 268-6500 🟩

D & S is a multi-disciplined Calgary company providing professional consulting services, software products and computer services to the petroleum industry worldwide. The company deals with all aspects of exploration, drilling, development, production, economics, reservoir engineering, enhanced recovery, computer modelling and project management.

Current research focuses on improved reservoir simulation methods including development of the FAST suite of reservoir simulators and implicit software formulation techniques; and on petroleum data management including the FORTE system for handling land interests, wells, reserves, revenues and cash flows.

With a fourth generation well log analysis system now complete, D&S has entered into a joint research venture with the Alberta Research Council to develop a fifth-generation system. Technology developed in the Artificial Intelligence Project will first be applied to log analysis, then to other software products. It will allow technicians as well as experts to quickly perform complex well log analyses.

DATAP Systems
A Division of Swan Wooster
Engineering Co. Ltd.
Suite 202
1167 Kensington Crescent N.W.
Calgary, Alberta
T2N 1X7
(403) 283-3601 🟦 🟩

DATAP Systems specializes in real time computer automation and control systems. As part of an organization providing professional engineering, technical and management services, DATAP has developed technology which is widely applied in the fields of petroleum production and pipelines, telecommunications, transportation, materials handling, process control and power distribution.

Serving both domestic and international markets with systems engineering, custom software and turnkey computer based systems services, DATAP has pioneered a number of advances including color semigraphic and full-graphic display systems, distributed control networks, and a variety of operator interfaces including sequential entry pushbutton panel, trackballs and light pens. DATAP's SCADA technology is embodied in the IRIS7 (Intelligent Realtime Information System).

Datek Industries Limited
8522 Davies Road
Edmonton, Alberta
T6E 4Y5
(403) 465-1530 🟩 🟦

Datek supports the Alberta resource industry through design, manufacture and programming of microcomputer systems for data acquisition, monitoring and control, and telemetry.

Much of the company's current research is directed at computer-based gas flow and oil flow measurement technology. It also has a comprehensive development program in remote control and data acquisition instrumentation.

Datek offers turnkey systems including oil and gas, power, water management and industrial control systems, manufactures printed circuit boards, handles environmental burn in testing, sheet metal fabrication and plastic injection molding and has facilities for both hardware and software design engineering.

Det norske Veritas
1110, 10201 Southport Road S.W.
Calgary, Alberta
T2W 4X9
(403) 253-3422 ⬛

A major international ship classification society headquartered in Norway, Det norske Veritas opened its Cold Climate Technology Centre in Calgary in 1981. This centre is the major cold climate research body for the society, which acts as a regulatory body in the classification, certification and quality assurance of ships and offshore exploration and production systems.

The Calgary centre conducts research and development on arctic submarine pipelines, ship-ice and structure-ice interaction, ice mechanics and engineering, materials technology and risk and safety aspects of energy, transportation and manufacturing industries.

Among recent research activities are a major international joint industry project to develop design criteria for ice loading on offshore structures, a project on the added mass of ships in interaction with ice, and a joint industry project on the optimum design strategy of arctic offshore pipelines subjected to ice hazard.

Dow Chemical Canada Inc.
Western Canada Division
P.O. Box 759
Fort Saskatchewan, Alberta
T8L 2P4
(403) 998-8282 🟪

From its Western Canada Division, Dow conducts a research effort of about $3 million annually. In addition to conducting process-type research, Dow works with its clients to develop new products and services for the petroleum, agriculture, mining and forest products industries, among others.

Dycor Industrial Research Ltd.
130, 17303 - 102 Avenue
Edmonton, Alberta
T5S 1J8
(403) 486-0091 🟩 🟨 🟦

Created to assist the research, industrial and military communities worldwide, Dycor is a wholly Alberta owned corporation established in 1981. It is active in such technological areas as

- computer system design and integration;
- data acquisition and control systems;
- custom instrumentation design;
- calibration standards;
- laser velocimetry and particle analysis;
- computerized image processing systems;
- robotics and automation;
- high pressure systems; and
- petrochemical research instrumentation.

Dycor offers extensive software development facilities, and marketing and distribution services for Canadian and foreign products.

E

EDO Canada Ltd.
8, 6320 - 11 Street S.E.
Calgary, Alberta
T2H 2L7
(403) 255-6667 🟦

The Calgary operation, a wholly-owned subsidiary of EDO Corporation of New York, develops, manufactures and markets high technology precision electronic instruments and systems for the land survey and marine positioning and navigation markets.

EDO Canada is a leader in the design and manufacture of dual channel satellite doppler receivers and in the development of sophisticated software programs to process acquired transit data. The firm is also expert in the development of integrated marine navigation and data acquisition systems for scientific research and seismic ships.

Under a Canadian government development contract, EDO Canada has merged Defence Research Establishment Ottawa technologies with its own to produce MINS, a small fixed-configuration integrated navigation system designed to meet the tactical requirements of Canada's naval force.

Esso Resources Canada Ltd.
Research Department
339 - 50th Avenue S.E.
Calgary, Alberta
T2G 2B3
(403) 259-0671 ⬛

Esso Resources' Research Centre in Calgary, established in 1955, was the first large oil company research centre to be located in Alberta. The centre's research effort covers a wide range of production technology from oil sands and heavy oil development and enhanced recovery of conventional oil to frontier production research focused primarily on the Mackenzie Delta/Beaufort Sea area. The latter includes field work and simulations in structures, transportation systems, soil and ice mechanics and environmental research.

Esso also maintains a research program in key earth science technologies such as seismic data gathering and processing, petrophysics and geochemistry.

G

Gemini Biochemical Research Ltd.
#350, 4520 - 16 Avenue N.W.
Calgary, Alberta
T3B 0M6
(403) 288-7771 🟨

Gemini Biochemical specializes in research aimed at improving the use of both renewable and non-renewable resources.

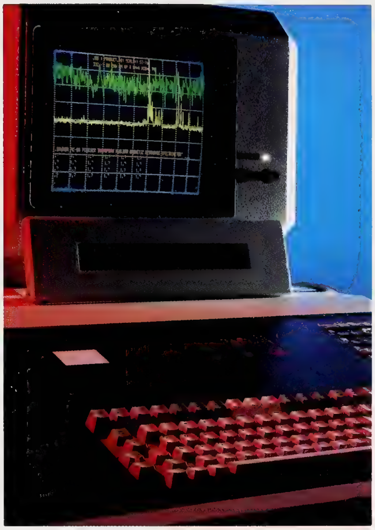
Working with both private companies and public sector agencies such as the National Research Council, Agriculture Canada, and the Alberta Oil Sands Technology and Research Authority, the firm carries out research in biotechnology, applied chemistry and environmental sciences. Gemini's long-range interests lie in fields such as microbial polysaccharides, fermentation technology, soil microbiology, use of natural gas as feedstock for fermentation, petrochemical transformations and alternative energy (bio-energy).

Current projects include research on biological methane control in coal mines, design of affordable bioreactors and production of microbial pesticides.

Gemini Biochemical is a Canadian controlled company incorporated in Alberta in 1981.

General Intermediates of Canada
10817 - 139 Street
Edmonton, Alberta
T5S 1G2
(403) 483-2783 🟪

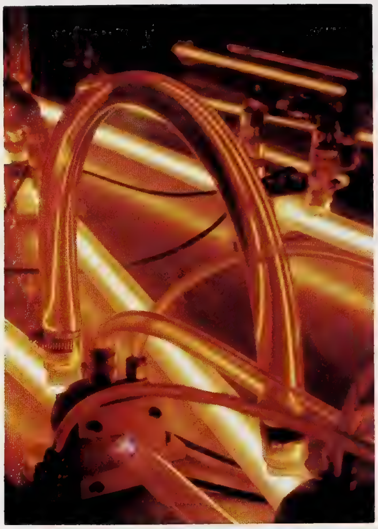
This company is a manufacturer of high quality pharmaceutical raw materials, with particular specialization



Dow Chemical Canada Inc

in complex purines/pyrimidines and amidines and their derivatives. The company manufactures under strict quality control using spectrometry, chromathography and other methods of analysis.

General Intermediates also offers custom synthesis and contract research and development. An additional specialization is in bromine/iodine chemistry.


General Systems Research

General Systems Research

2200, 10104 - 103 Avenue
Edmonton, Alberta
T5J 0H8
(403) 424-2000 🟦

General Systems Research is a leader in advanced CAD/CAM laser cutting systems. Well established in the automotive industry, the company has expanded the scope of its aerospace technologies division with a contract to supply key elements of a $650-million Low Level Air Defence (LLAD) system for the federal government as a member of the Oerlikon-Litton consortium.

GSR's contribution involves the manufacture of key components, including precision elements of the laser guidance system for the missile-based Air Defence Anti-Tank System known as ADATS.

To assist the firm in expanding the export potential of its industrial laser technology, the Alberta government has invested $15 million in the firm through the purchase of preferred shares which GSR will redeem over a five-year period.

GEOTECHnical Resources Ltd.

4500 - 5 Street N.E.
Calgary, Alberta
T2E 7C3
(403) 230-4128 🟩 ⬛

GEOTECH offers applied technology in engineering and geosciences to a market which includes the resource industry, government departments and other service companies.

The firm's Engineering Division has served the needs of arctic offshore exploration from Alaska to Labrador, applying engineering principles and practices in innovative ways to solve problems for which standard practices were not applicable. Using a multi-disciplinary approach to project planning, design, execution and management, GEOTECH engineers have handled a wide range of assignments.

Within the Division, the Arctic Group provides cold room laboratory services as well as Arctic field services including monitoring, measurement, testing and construction related both to ice and permafrost.

GEOTECH's capabilities include

- research and engineering services in the fields of civil, mechanical, electrical and electronics, and offshore;
- project management;
- laboratory equipment design, development and fabrication;
- specialty tests and procedures in the areas of routine and supplementary core analysis;
- petrophysical studies; and
- chemical analysis.

All aspects of the company's operations are supported by a computer services group which has introduced innovations in computer graphics, data acquisition and instrumentation and control.

Global Thermoelectric Power Systems Ltd.

901 - 5 Avenue, Box 400
Bassano, Alberta
T0J 0B0
(403) 641-3512 🟨

One of only three manufacturers of thermoelectric generators in the world, Global provides remote power systems which burn fossil fuels, converting them into electrical power. Its R&D division is improving the practical application of thermoelectrics with system development design.

Rapid advancement is being made in liquid-fueled combustion techniques, ultra-sonic atomization, new burner systems and thermoelectric converter designs. In addition to marketing its existing commercial products, Global has been instrumental in developing several military prototypes, including a portable vehicle engine heater, a 0.5kw generator and a portable 0.1kw manpack power source. New commercial products include a hazardous area generator for locations where flammable gases or vapors are present in quantities sufficient to produce an explosion. The firm works on projects in conjunction with both the provincial and federal governments.

Gulf Canada Resources
P.O. Box 130
Calgary, Alberta
T2P 2H7
(403) 233-4000 ■

Gulf Canada Resources conducts its own research and development programs and also participates in other industry and government projects.

Gulf geophysicists have developed a video display work station for interpretation of three-dimensional seismic data; are developing programs for a vertical seismic profile processing sequence; and have a project underway for developing new methods for signal enhancement of seismic data using principle components analysis.

In oil sands research the RTR/Gulf extraction process, under development since 1981, features reduced energy demand, elimination of traditional tailings ponds, and facilitation of site reclamation. The Gulf DRB process, developed as a more efficient method of upgrading Athabasca bitumen to synthetic oil, was recently tested on commercial-sized equipment in France. Ownership resulting from joint financing of the test is shared equally by Gulf Canada, AOSTRA and ASVAHL (a French consortium).

H

Harding Instrument Co. Ltd.
4608 - 97 Street
Edmonton, Alberta
T6E 5N9
(403) 438-6800 🟦

Harding Instruments is a Canadian-owned company engaged in electronic design and manufacturing. It specializes in microelectronic-based products for the telephone, oil and gas, and agricultural industries.

The firm has a strong engineering staff and does all its own research and development. In addition to its own product development, Harding Instruments undertakes custom electronic engineering projects, usually involving the application of microprocessors. The company has also developed in-house expertise in injection mold plastic packaging and product certification procedures (CSA, DOC, UL, FCC).

Harding Instruments markets some of its products through OEM contracts and others through distributors and dealers. It has an extensive marketing network for its telephone products and has signed distribution agreements with telephone equipment outlets and major telephone companies in the United States and Canada. Most of the company's oil and gas flow measurement products are marketed through an OEM contract with ITT Barton.

Hycal Energy Research Laboratories Ltd.
1338A - 36 Avenue N.E.
Calgary, Alberta
T2E 6T6
(403) 250-5800 ■

A Canadian controlled private high technology company, Hycal has developed equipment to handle research which formerly had to be done outside Canada. Formed in 1976, the company provides applied research and consulting services to the petroleum industry in reservoir engineering and enhanced recovery.

Offering a variety of laboratory and field studies, numerical simulation and process development services, Hycal also fabricates laboratory equipment through an associated company, Hycal Laboratories Equipment Ltd.

The firm has developed a strong international profile, working for companies in Canada, the United States, Europe, Asia, Africa and South America. It has provided design data and developed processes for a number of pilots in Canada, the United States and Peru.

I

IDACOM Electronics Ltd.
9411 - 20 Avenue
Edmonton, Alberta
T6N 1E5
(403) 450-2468 🟦

Specializing in the design and manufacture of sophisticated data communications testing equipment, IDACOM produces high speed data network analyzers and communications protocol testing devices.

Major clients are telephone companies, manufacturers of communications equipment and private operators of data communications networks. Its major product is the PT/MPT Protocol Analyzer, designed to monitor, emulate and intercept or modify data communications protocols. It can also be used as a development aid.

In 1985 Vencap Equities Alberta Ltd., the provincially supported venture capital firm, invested $600,000 in IDACOM, enabling the company to expand its manufacturing, research and development activities. Approximately 90 per cent of the firm's products and services are exported, chiefly to the United States, Europe and Japan.

INTERA Technologies Ltd.
2500, 101 - 6 Avenue S.W.
Calgary, Alberta
T2P 3P4
(403) 266-0900 🟦 🟨

INTERA is the first company in the world to develop synthetic aperture radar (SAR) systems for commercial use. The firm recently enhanced its reputation in the field of real-time ice surveillance and terrain data collection by introducing a second airborne radar with new digital electronics. The system, called STAR-2, will operate as a companion to STAR-1, the company's original airborne radar system.

Advances incorporated into STAR-2 include enhanced processing speed, higher resolution data collection, all-digital display and recording systems and a superior annotation system. The new features will provide INTERA's customers with better turnkey data collection and mapping services, including the ability to produce digital terrain models, radar image maps, togographic maps and other radar map products.

New research into land-use and forestry applications is under way in co-operation with commercial and government agencies.

ITRES Research Limited
Suite 141, Calgary Advanced
Technology Center
6815 - 8 Street N.E.
Calgary, Alberta
T2E 7H7
(403) 274-7440 🟨 🟦

ITRES Research, incorporated in 1979 by a group of engineers and scientists with industrial, government and university backgrounds, derives its name from its goals: **I**nnovation, **T**echnology, **R**esearch, **E**xcellence and **S**cience. A private, Canadian-owned company, it carries out research and development in electronics, electro-optics and advanced instrumentation, and manufactures digital CCD camera systems.

The firm is currently collaborating with the University of Arizona on development of an imager spectrograph instrument to fly on the space shuttle. It is also developing a compact, low-cost airborne multispectral scanner for general remote sensing application.

ITRES technical staff have extensive background in CCD technology and applications (remote sensing, x-ray detection, ultra violet, infra red, and low-light-level imaging and machine vision) and optical disk technology, digital and analog circuit design and software design and implementation.

K

Keyword Office Technologies Ltd.
2816 - 11 Street N.E.
Calgary, Alberta
T2E 7S7
(403) 250-1770 🟩

Founded in 1979 as a service bureau, Keyword Office Technologies Ltd. has become a world pioneer in the enhancement of existing office automation technologies to deliver total document interchange solutions within corporate PC workstation word processors and computer system environments. Its products are marketed throughout North America, Europe, Australia and South East Asia.

Jointly owned by private interests and TransAlta Resources Corporation (the investment arm of TransAlta Utilities), the firm has developed the KEYWORD 7000/8000, a combination hardware/software system which integrates incompatible word processing systems through high fidelity document conversion.

Recently the firm introduced KEYpak, a document interchange software package for DEC VAX and AT&T 3B Systems. Within VAX environment it runs as a background task to ALL-IN-1 Mail, providing on-line Editable Document Exchange within the context of existing office automation systems.

L

LSI Logic Corporation of Canada, Inc.
Petro-Canada Centre
Suite 3410, 150 - 6 Avenue S.W.
Calgary, Alberta
T2P 3Y7
(403) 262-9292 🟩

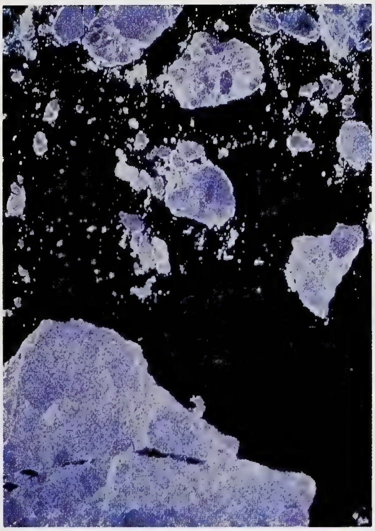
LSI Logic Corporation of Canada, Inc. designs, produces and markets application-specific integrated circuits (ASICs) for electronic applications and provides related design and technology services, all based principally on gate array semiconductor technology.

The corporation's ASIC products and design services enable its customers to reduce component design costs, improve product performance, retain control over proprietary logic, shorten product development cycles and reduce the physical size of the customer's electronic system. The corporation's products and services are marketed primarily to manufacturers in the telecommunications, electronic data processing, military and aerospace industries in Canada and South Korea.

The corporation, which is headquartered in Calgary has design centres and sales offices in Calgary, Edmonton, Ottawa, Toronto, Vancouver and Seoul, South Korea, with a seventh design centre and sales office planned for Montreal in the second half of 1987. The corporation currently has its products manufactured at the Alberta Microelectronic Centre in Edmonton and by LSI Logic Corporation in the United States. The corporation intends to establish additional manufacturing facilities in Alberta in 1987 and 1988.

The corporation is a member of the LSI Group of companies which operates 24 design centres and six manufacturing facilities worldwide and employs over 1,800 people. During 1986, the consolidated revenues of the LSI Group were U.S. $194,335.000. The corporation has access to the LSI

Group's ASIC technology innovations allowing it to bring to the Canadian marketplace products and services which are at the leading edge of technology.


Intera Technologies Ltd.

Lakewood Systems Ltd.
Research Centre One
9413 - 20 Avenue
Edmonton, Alberta
T6N 1E5
(403) 462-9110 🟧 🟦

Lakewood Systems Ltd. (formerly Lakewood Engineering) designs, manufactures and sells industrial monitoring and control systems with a focus on environmental, forestry and agricultural monitoring applications.

Products include portable datalogging systems, telemetering systems and various instrumentation devices. A major R&D effort has produced a compact data recording system designed for high reliability and accuracy under remote operating conditions. Equipped with a three-year power supply and 10-year data retention capacity, the unit has been shown to operate successfully in a temperature range of -40 C to +55 C.

Located in the Edmonton Research & Development Park, Lakewood markets its products to municipal utilities, remote agricultural research stations, laboratories and the oil and gas industry. The firm has developed a major export market for its products in Southeast Asia.

Leaf Electronics Ltd.
28 Grandin Road
St. Albert, Alberta
T8N 0S1
(403) 458-3836 🟧

Leaf Electronics is a wholly Alberta owned firm specializing in the design and manufacture of control modules for artificial limbs, aids to the handicapped, and control of hazardous environment equipment. Incorporated in 1977, the company also designs and manufactures biomedical instrumentation, primarily special purpose electromyographic (E.M.G.) equipment. On a custom basis, it produces a batteryless implantable biotelemetry transmitter for neural or E.M.G. signals.

Leaf technology has helped extend the range of patients who can be fitted with electronic aids because it utilizes fewer and more difficult control sites and supplies an interface between incompatible systems of different manufacturers. Products include a number of "building block" modules such as the PCL-1, a motor driver for wrist, hand and elbow; and the TC-2, a dual channel device for obtaining digital control signals from skin conductivity. Medical instrumentation includes devices used in basic physiological research and in zoological, entomological, dental, clinical and sports medicine.

Current research focuses on functional electrical stimulation for the handicapped and on a multi microprocessor-controlled biomedical data acquisition system.

M

Myrias Research Corporation
200, 10328 - 81 Avenue
Edmonton, Alberta
T6E 1X2
(403) 432-1616 🟩

Established in 1982, Myrias is considered a major contender in the race to build the world's fastest and most advanced supercomputers.

The company is developing a parallel processing computer system designed to enable scientists and engineers to use the power of hundreds or thousands of microprocessors in parallel to solve large numerical computing problems. The resulting system will range in size from small configurations of fewer than 100 processors to large supercomputer class configurations.

Myrias has attracted financial support from Canadian and U.S. governments and venture capital firms.

N

Norac Technologies Inc.
4222 - 97 Street
Greystone Pavillion
Edmonton, Alberta
T6E 5Z9
(403) 461-7163 🟦

A Canadian pioneer in the advanced extraction technology known as Supercritical Gas Extraction (SCGE), Norac Technologies Inc. plans a new world class research and commercial facility for Alberta. It will be designed to develop the extraction and separation processes for a wide range of products used in the food and flavoring, pharmaceutical, health food, cosmetic and biochemical industries. The facility is to be a full service organization accommodating research, scale-up, economic analysis, product samples design and manufacturing of equipment.

An Alberta corporation owned and controlled by its management group and with equity of $15 million (supplied in part by European investors), Norac operates from headquarters in Edmonton. The company is in the process of designing, engineering and purchasing the five extraction plants, based on Norac technology, which will make up the complex.

The advantages of extracting vital components by means of neutral and biologically compatible gases under critical conditions are now fully recognized by research organizations, processing companies and regulatory authorities throughout the world. The technology would ultimately be applied to produce drug compounds, natural vitamins, essential oils, deodorized fish oil, aromas and flavors, and biotechnology products.

Norstar Instruments Ltd.
319 - 2 Avenue S.W.
Calgary, Alberta
T2P 0C5
(403) 262-0800 ■

Norstar Instruments was formed in 1985 to produce Global Positioning System (GPS) satellite receivers and related equipment. It is a subsidiary of Nortech Surveys (Canada) Inc., suppliers of positioning/navigation services. The Norstar 1000, its first product, combines Nortech's operational experience with leading edge electronic development. It is a sophisticated multi-channel self-contained receiver operating on the L_1 frequency. Built with up to seven dedicated receiving channels, it can track several satellites continuously, and simultaneously record a wide variety of operator definable data.

Powerful units offering precision accuracy and high performance, Norstar 1000 receivers have applications ranging from geodetic positioning to dynamic navigation. Specific applications include tectonic and offshore platform subsidence monitoring, marine geophysical work (including 3-D seismic, radio positioning calibration and rig moves) and airborne magnetic surveys in remote and difficult areas.

Making its expertise available to end-users of the technology, the Norstar team has more than 10 years of operating experience with the GPS system.

Recent sales include two GPS receivers to the U.S. Air Force Nellis Base in Las Vegas, Nevada, to be used for siting radar and range targets.

Nortech Surveys (Canada) Inc.
Century Square 111, Second Floor
319 - 2 Avenue S.W.
Calgary, Alberta
T2P 0C5
(403) 262-0800 ■

Nortech Surveys was formed in 1982 through purchase of assets of Sheltech Canada, a division of Shell Canada Limited. Owned in part by its employees, the firm is involved in the development of sophisticated positioning and navigation systems for mapping, control, and remote sensing applications.

Nortech pioneered software development and positioning applications of the U.S. Navy Navigation Satellite System, and inertial guidance systems. These and related services have been provided to petroleum companies and government agencies in many countries.

Nortech has developed and is applying navigation and positioning technologies using the U.S. Navstar/Global Positioning System. The firm is developing integrated navigation systems under contract for various government and private sector organizations. It provides precise geodetic control onshore and offshore to the petroleum and geophysical industries. A wholly-owned subsidiary, Norstar Instruments Ltd., has developed a sophisticated GPS satellite receiver for these and other applications.

Under a joint venture with the Alberta Research Council, it has developed a sophisticated airborne positioning system integrated with an advanced terrain laser profiling system for mapping and route selection purposes.

The company has regional offices in the United Kingdom, Oman and Turkey and representation in Australia.

Northern Telecom Canada Limited
P.O. Box 1974
Edmonton, Alberta
T5J 2P4
(403) 441-3100 ■

Northern Telecom, the world's leading supplier of fully digital telecommunications systems and a major supplier of integrated information systems for the office, maintains a strong manufacturing and marketing presence in Alberta, with 1,000 employees and a payroll of more than $37 million.

The corporation's digital switching division plant in Calgary manufactures the DMS (Digital Multiplex System) family of digital switches for handling local and long distance calls. These products have been installed throughout North America, the Caribbean, Europe and the Pacific Rim. The business products division manufactures the Vantage family of electronic key telephones and systems for use by small to medium-sized businesses throughout North America.

Northern Telecom operates 24 manufacturing plants in Canada. Through its research subsidiary, Bell Northern Research (BNR), the corporation invests more than 10 per cent of revenues each year in the research and development of sophisticated telecommunications products for local, national and international markets. BNR is a partner in the Alberta Telecommunications Research Centre.

NOVA/Husky Research Corporation Ltd.
1411 - 25 Avenue N.E.
Calgary, Alberta
T2E 7L6
(403) 291-4544

This Calgary-based technology centre is owned jointly by NOVA, AN ALBERTA CORPORATION and Husky Oil Operations Ltd. Drawing on the expertise of an internationally trained team of scientists, the corporation's initial research thrusts have been in the areas of:

- bioscience as it relates to enhanced oil recovery, corrosion and new product development;
- chemical science and its application in enhanced oil recovery, catalysis, and product upgrading;
- petrochemistry;
- fluid dynamics of pipeline operations; and
- electronics development for operational needs.

NovAtel Communications Ltd.
Western Canadian Place
700 - 9 Avenue S.W.
Calgary, Alberta
T2P 3V4
(403) 298-0444

A North American leader in the research, development, manufacture and marketing of advanced cellular telecommunications systems and cellular telephones, NovAtel in 1983 put North America's first 400 MHz cellular system and the first decentralized system in the world into commercial operation in Alberta.

Through computer-based control, the system routes all traffic through local exchanges, using the existing land network and eliminating the need for an expensive "central switch", while reducing the operational expense of "backhauling" calls over miles of dedicated circuits.

NovAtel also manufactures a complete family of cellular mobile telephones. The company's cellular products utilize Very Large Scale Integration (VLSI) technology, involving tens of thousands of electronic components integrated on a single silicon chip. With the aid of Computer Aided Design (CAD) tools, the company is developing custom integrated circuit designs, utilizing Complementary Metal Oxide Semiconductor (CMOS) technology.

Advanced Technology at NovAtel is involved in applied research of novel digital communication networks and terminal products. Research centres on:

- use of infra-red light for high-speed, free space transmission;
- voice recognition for control over the functions of automatic systems through use of the spoken word;
- digital switching and transmission systems;
- digital radio transmission; radio propagation within building structures; and alternatives for high volume, low cost, high reliability packaging.

NovAtel employs 730 in the research, development and manufacture of cellular telephone systems and cellular telephones.

Northern Telecom Canada Limited

Novatex Manufacturing Canada Ltd.
5404 - 36 Street, S.E.
Calgary, Alberta
T2C 1P1
(403) 279-6673 🟦

Novatex uses unique circular looms to "weave" extruded plastic pellets into polypropylene bag and sheet products for industrial uses. Each loom, fed by approximately 1,720 bobbins, spins at high speed, weaving the plastic fabric in a large sock-like tube. Novatex is the only company in Canada using this technology and one of only a few in North America.

Novatex woven plastic is used in fertilizer, chemical and animal feed bags and tarpaulins, lumber wrap and awning materials. Primary markets for the company's products are Western Canada and Northwestern United States.

O

Omara Systems Inc.
10639 - 172 Street
Edmonton, Alberta
T5S 1P1
(403) 486-2252 🟧

Omara Systems Inc. is an electronic industrial control company incorporated in 1985 by two electrical engineers from the University of Alberta and a group of Edmonton businessmen.

The company has developed a solid state controller for heat tracing used in petrochemical plants and petroleum refineries. The sophisticated HTC-9000 system incorporates Motorola microprocessors, and in addition to providing thermostatic operation, offers fault monitoring and local and remote diagnostic reporting.

Omara designed and manufactured a low voltage control system to control remote lighting and power receptacles along Edmonton's Jasper Avenue.

In 1986 Spurt Investment Fund I, a $3-million venture capital fund managed by Alta-Can Telecom Inc., invested $250,000 in Omara, encouraging the firm to translate its new technology into a viable Alberta business.

P

PSI Energy Software Ltd.
914 - 15 Avenue S.W.
Calgary, Alberta
T2R 0S3
(403) 245-6820 🟩

The petroleum industry's need for a software model to evaluate the economic potential of oil and gas properties led to the establishment of PSI Energy Software in 1971. The company, which maintains Canadian corporate headquarters in Calgary, developed the first such program to incorporate both Canadian and American regulations. Today it offers a variety of software products and technical and consulting services to the oil and gas business and its service industries.

Products include systems for determining the profitability of oil and gas opportunities, including a variety of planning, production, operation, scheduling and decision-making functions; forecasting future production rates and reserves from historical oil/gas production data; and evaluating exploration investment opportunities.

All PSI programs are continuously updated to keep pace with regulatory, price and other industry changes in the United States, Canada, the United Kingdom and other countries. New product development is aimed at providing a changing petroleum industry with the software it requires to meet future demands.

Palco Telecom Ltd.
7825 Flint Road S.E.
Calgary, Alberta
T2H 1G3
(403) 255-4481 🟦

Palco Telecom Ltd. specializes in telecommunications services and products for telephone companies in Western Canada.

The firm's current research is aimed at enhancement of a chemical process for vapor polishing plastic components. The process has potential for a number of other industrial applications, utilizing ABS.

Palco is also involved in electronics research and development.

Pelorus Aviation Supplies Canada Ltd.
202, 575 Palmer Road N.E.
Calgary, Alberta
T2E 7G4
(403) 250-9377 🟦

Pelorus manufactures and installs electronic distance measuring equipment (DME) for airports. The company also produces the innovative Automated Weather Observation and Reporting System (AWORS). When installed at a remote, untended airport, AWORS will take continuous observations of relevant weather data and transmit them to incoming aircraft using a microchip voice processor.

Major clients are Canadian provincial and municipal governments which operate airports. The company is also exploring markets in Europe and the Pacific Rim.

Prairie Biological Research Ltd.
10515 - 36A Avenue
Edmonton, Alberta
T6J 2H7
(403) 450-5321 🟨

Prairie Biological Research Ltd. (PBR) was founded primarily to service increasing demand for biological testing from regulatory agencies.

PBR scientists offer short-term biological tests to screen for chemicals which pose a potential hazard to human health, with emphasis on testing for environmental carcinogens. These tests are also applied for screening humans for exposure to known or suspected mutagenic and carcinogenic agents. Other services include microbiological tests as applied to environmental samples, food, water and various consumer products, and protein fingerprinting of cultivars for the purposes of seed certification and patent applications. In addition, PBR provides short- and long-term consulting on problems related to health hazards of chemicals in the environment and workplace, biosafety, biotechnology risk assessments and compliance requirements for biologics and biotechnology.

To maintain its position at the forefront of genetic toxicology, the firm is committed to an active R&D program. PBR scientists continue to develop and improve mutagenicity test systems by applying recombinant DNA and gene cloning technology. PBR invites joint venture participation from academic and industrial organizations.

Pulsonic Geophysical Ltd.
10201 Southport Road, Suite 700
Calgary, Alberta
T2W 4X9
(403) 255-2820 🟥

One of the largest companies of its kind in Canada, Pulsonic Geophysical Ltd. is dedicated to geophysical research, software development and seismic data processing. Established in 1981, the employee-owned operation has a strong R&D focus which has contributed to the creation of a diverse and flexible seismic processing system and to the development of specialized software and expertise in systems development.

Future research will be directed toward developing faster, more cost-effective processing methods, utilizing supercomputer technology. The firm is also working on innovative methods of processing seismic data, designed to lower the cost of finding new oil reserves. Expertise developed in the seismic area will be applied to other types of specialty signal processing.

Q

Q.C. Data Collectors
1200, 635 - 8 Avenue S.W.
Calgary, Alberta
T2P 3M3
(403) 269-3306 🟩

As a result of a joint research venture with the Alberta Research Council, Q.C. Data Collectors has developed new technology for translating data from hard copy maps, engineering drawings and other documents to computer files. With the help of a new map editing work station which uses an inexpensive desk-top computer, the user can quickly manipulate and analyze vector and raster input to classify, correct, join, and tag data.

The firm was established in Calgary in 1977 to digitize well logs. It has since become the largest company in the world in that field, employing approximately 75 in Calgary and operating offices in Denver, Houston and Los Angeles. Earlier research efforts have produced specialized software and, in the early 1980s, an automatic well log scanner developed as part of a federal government research project.

R

RTS Electronic Manufacturing Ltd.
10334 - 172 Street
Edmonton, Alberta
T5S 1G9
(403) 484-9031 🟧

As the only major Canadian manufacturer of Cathodic Protection Rectifiers, RTS Electronic Manufacturing has established a solid presence in the corrosion prevention industry. Relying on its in-house technology and circuit and design capability, RTS also manufactures custom power supplies.

The firm stocks parts and has repair and test facilities for all makes of cathodic rectifiers. Its transformer winding department supplies custom made transformers for rectifiers and other customer requirements.

Raylo Chemicals
Division of Terochem Laboratories Ltd.
8045 Argyll Road
Edmonton, Alberta
T6C 4A9
(403) 468-6060 🟪

With the help of a technology transfer grant from the Alberta Heritage Foundation for Medical Research, Raylo is working to produce thymidine at feasible cost. Thymidine is a nucleoside derivative and main starting ingredient in AZT, a drug used to treat AIDS patients. The expertise Raylo has developed in the field of nucleosides has made it one of the most important manufacturers of these biochemicals worldwide.

The thymidine project is just one in a series of initiatives undertaken by the Edmonton-based chemical firm which researches, develops and manufactures high technology specialty chemicals and polymers, most of which are exported for use outside of Canada. Raylo manufactures custom chemicals such as pharmaceutical intermediate and end products; specialty polymers, used primarily in the aerospace industry; pheromones, chemically produced insect attractants used by the agriculture industry for pest control; and products for treating radioactive wastes.

The company's contract research and manufacturing activities have included development of products for use in oil, gas and coal recovery; synthetic DNA replication and other biotechnological applications; pharmaceutical trials; and in the rubber, agriculture and other industries.

In 1987, Raylo was cited by the Canadian Advanced Technology Association for being "literally at the leading edge of the development of new emerging technogies . . . across a wide spectrum of product lines".

Rosemount Instruments Ltd.
808 - 55 Avenue N.E.
Calgary, Alberta
T2E 6Y4
(403) 275-8400 🟨

A broad-based instrument company serving the pulp and paper, oil and gas, chemical, petrochemical, food, beverage, pharmaceutical and aerospace sectors, Rosemount Instruments is a wholly owned subsidiary of Rosemount Inc. of Minneapolis, Minnesota, which is part of Emerson Electric of St. Louis, Missouri.

Products for the industrial process instrumentation and control markets include flow, pressure, temperature, density, level and weight sensors and transmitters, gas and liquid analytical instruments and distributed process control systems. Rosemount also supplies a variety of air data sensors for the aerospace industry.

The firm's Calgary headquarters and eight regional sales and service offices employ more than 140 Canadians.

S

S.P.I. Synthetic Peptides Incorporated
Department of Biochemistry
University of Alberta
Edmonton, Alberta
T6G 2H7
(403) 432-2758 🟨

S.P.I. Synthetic Peptides Incorporated was established in 1986 to develop and produce biologically active peptides, peptide diagnostics and synthetic vaccines. The firm, which has established headquarters and research facilities in Edmonton and marketing offices in Richmond Hill, Ontario, is one of the first Canadian owned and controlled companies involved in the production, formulation, manufacture and sale of synthetic peptide pharmaceuticals.

S.P.I. maintains close links with the University of Alberta through two of its founders, Dr. R.S. Hodges and Dr. J.M.R. Parker, of the Department of Biochemistry in the Faculty of Medicine. Both are widely recognized for research in the field of protein/peptide structure and function.

Research and development efforts are centred on production of new patentable products, investigation of new uses for existing pharmaceutical products, and development of new methodology and instrumentation related to peptide synthesis and purification.

Schlumberger of Canada
2400, 801 - 6 Avenue S.W.
Calgary, Alberta
T2P 3W2
(403) 231-9600 ⬛

Schlumberger of Canada is an oilfield services firm specializing in downhole electronic wireline well logging, wireline well completion and drill stem and surface testing. Ongoing product development and research is conducted at Calgary headquarters of Schlumberger. The firm also has access to R & D conducted by the parent company, Schlumberger Ltd. in the United States and overseas locations.

Sea Scan Technology (Canada) Inc.
Unit 1, 4393 - 14 Street N.E.
Calgary, Alberta
T2E 7A9
(403) 250-5577 🟦

Sea Scan Technology (Canada) Inc. manufactures remotely operated vehicles (ROVs) for a variety of underwater surveillance and viewing projects. Clients range from diving operations and off-shore construction firms to nuclear power plants and the military.

Equipped with video cameras, Sea Scan's miniature submarines rely on unique manoeuvrability to capture underwater pictures on color monitors or on VHS tapes.

Launched in 1985, the firm sells its products through distributors in Canada and the United States. R&D currently focuses on specialized "add-on" features such as manipulator arms for the ROVs. The firm has sold its "Sea Whip" unit to the U.S. Navy and Hydro Quebec and has custom built a special unit for an Ontario Hydro nuclear plant.

Shell Canada Limited
P.O. Box 100, Stn. "M"
Calgary, Alberta
T2P 2H5
(403) 232-3111 ⬛

Shell's $21-million Calgary Research Centre provides a focus for all of the company's upstream research and development in Canada. The four main areas of research —enhanced oil recovery, oil sands development, materials and corrosion studies, and geological research — are associated with development of the company's large oil and gas resource base in Alberta.

Research efforts include work aimed at improving the ability to predict rock porosity and permeability to allow more economic exploration for oil and gas. Research into the development of discretionary very sour sulphur reserves is a new thrust.

Shell is also studying the enhanced recovery of conventional oil through miscible flooding and enhanced oil sands recovery through steam and hot water injection. In its Calgary head office, Shell Canada carries out a small R & D effort exploring Artificial Intelligence and its potential applications within the company.

Sherrex Systems Ltd.
4196 - 93 Street
Edmonton, Alberta
T6E 5P5
(403) 462-4085 🟪

Active in Alberta since 1980, Sherrex Systems is an electronic engineering company that designs and manufactures more than 50 high technology products used by the industrial sector for control and monitoring of processes, buildings and computers.

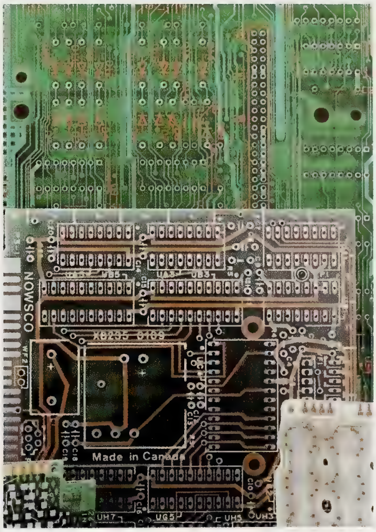
The firm also has strength in fibre optic communication products and industrial fibre optic systems, providing design, construction, installation and testing services.

The company's major research thrust is on development of microprocessor-based remote monitoring and control units.

Sherritt Gordon Mines Limited
Fort Saskatchewan, Alberta
T8L 2P2
(403) 998-6911 🟦

Since 1954, Sherritt has operated a nickel and cobalt refinery at Fort Saskatchewan based on the company's unique pressure hydrometallurgical process technology. The process also recovers sulphur in the form of fertilizer grade amonium sulphate byproduct. This has led Sherritt to diversify into a range of other nitrogen and phosphate fertilizers and to its position today as a major Western Canadian fertilizer producer.

Metal refining has led to diverse metal fabricating facilities such as a rolling mill, coinage plant, mint and specialty metal powder production facilities. Much of Sherritt's multi-million dollar research, development and engineering effort is carried out in support of prospective process licensing opportunities.



Suncor Inc.
P.O. Box 4001
Fort McMurray, Alberta
T9H 3E3
(403) 743-6411 ⬛

Suncor Inc., one of Canada's major integrated oil and gas companies, opened the world's first commercial plant for extracting oil from oil sands in 1967 near Fort McMurray. A major Suncor research project focuses on the recovery of bitumen from sludge and has involved construction of a $3-million pilot plant and an annual expenditure of about $1 million.

Other current Suncor research efforts include development of bitumen skimmers to recover bitumen coming through the tailings line; mining techniques for efficient recovery from waste zones; and improvements to extraction, mining and recovery technologies. Some of these projects are carried out in cooperation with AOSTRA.

Synerlogic Inc.
Suite 1300, 635 - 8 Avenue S.W.
Calgary, Alberta
T2P 3M3
(403) 237-6500 🟩

Synerlogic is one of Canada's largest full-service information systems consulting firms. The company provides information systems solutions to assist clients in more effectively managing their business.

Synerlogic, a privately owned company, is headquartered in Calgary with nine branch offices located from coast to coast across Canada. One of the major shareholders is Vencap Equities Alberta Ltd., an Alberta-based venture capital fund.

Synerlogic services clients in manufacturing and distribution, financial and insurance, oil and gas, government and medical and the defence/space verticals. Through its professional employees, the company has performed systems integration projects, facilities management, electronic data interchange consulting and has provided temporary technical services. The projects have been undertaken with Synerlogic providing all management support as well as the company employees working integral to the client organization.

SynPhar Laboratories Inc.
4290 - 91 A Street
Edmonton, Alberta
T6E 5V2
(403) 462-4044 🟥 🟨

Research conducted in the University of Alberta laboratories of Dr. Ronald G. Micetich forms the basis for this Alberta-based pharmaceutical operation. Established in cooperation with Japan's Taiho Pharmaceutical, SynPhar Laboratories Inc. designs, synthesizes and tests new drugs in areas ranging from antibiotics and anti-viral agents (research in this area has been funded by the Alberta Heritage Foundation for Medical Research), to anti-cancer drugs including those designed to target monoclonal antibodies directly at specific sites in the treatment of cancer.

Established in 1987, the firm expects ultimately to employ 250 in a manufacturing and marketing operation designed to serve the North American and Japanese markets.

The company also investigates technology developed by other Alberta and Canadian scientists to assess its commercial possibilities.

T

Technifluids/NMC Inc.
3025 Bow Valley Square IV
250 - 6 Avenue S.W.
Calgary, Alberta
T2P 3H7
(403) 237-0346 🟦

Formed through the merger of Technifluids, the drilling fluids division of Trans Canada Resources, and National Mud Control Laboratories, the drilling fluids operation of CIL Inc., Technifluids/NMC is now a CIL subsidiary and the largest drilling and completion fluids company in Canada. The company serves both domestic and international markets with its products and technical services.

Products include a range of specialized and generic materials such as polymers and surfactants, salts and clays, corrosion inhibitors and lubricants, specialty blends, and density control additives. The firm is an active member of the Canadian research community, having worked with universities, other research groups and research foundations across the country. Many of its innovative products have become standard within the industry.

In addition to handling conventional land work, Technifluids/NMC conducts offshore work on floating and semi-submersible vessels and artificial islands, and the water or oil based fluid systems used in such operations.

Teknica Resource Development Ltd.
Suite 1100, 736 - 6 Avenue S.W.
Calgary, Alberta
T2P 3T7
(403) 269-4386 🟩

An internationally recognized source of advanced petroleum exploration and development technology and expertise, Teknica is the only Canadian company doing large integrated international geological petroleum basin studies, including research into hydrocarbon sources and maturation.

The firm developed the seismic inversion process, which allows seismic imaging of the subsurface geological sequence to reveal rock type as well as rock shape. Under favorable conditions, the process allows mapping of the extent and distribution of a new reservoir prior to drilling.

To further advance this technology, industry and government are jointly funding a project to develop a highly automated, integrated computer-based interactive exploration and development system. To help evaluate information obtained through this and other techniques, Teknica pioneered the application of color displays now used around the world.

Trison Instruments Ltd.
485 Sioux Road
Sherwood Park, Alberta
T8A 4H2
(403) 467-1644 🟦

Recognizing a need, then designing and manufacturing the product to fill that need has paid off for Trison Instruments Ltd., a small but innovative telecommunications operation in Sherwood Park. Noting, for example, the lack of a Canadian-built program control unit for use in programming school time clocks, the company developed a unit which management describes as "a small energy management system". The technology, now in use by Edwards of Canada, is incorporated into the Edwards 2470 control system, sold throughout Canada and the U.S.

The company also manufactures runway lighting control equipment which has been installed on some 40 major airports across Canada.

Now heavily involved in telephone development work, Trison has developed a party line converter which gives ringing and conversation privacy. The device also allows the use of urban telephone apparatus such as electronic telephones, wireless telephones, auto/answer machines and computer modems, none of which can currently be used on conventional party lines. Trison hopes to target the technology at some eight million party line subscribers throughout North America.

Tsiger Systems Corporation
4254 - 93 Street
Edmonton, Alberta
T6E 5K6
(403) 450-2358 🟦

Flat, thin microwave antennas, based on technology developed by Tsiger Systems Corporation, are expected to revolutionize the traditional parabolic microwave antenna market.

A lightweight, low profile antenna, the Tsiger product is designed for the TVRO (Television Receive Only) market in C. Band and is the first flat satellite antenna made especially for the home satellite market. Future designs will be aimed at the KU-Band TVRO market, telecommunication up and down satellite links and military applications.

Tycor Electronic Products Ltd.
6107 - 6 Street S.E.
Calgary, Alberta
T2H 1L9
(403) 259-3200 🟨

Tycor, a wholly Canadian owned company headquartered in Calgary, combines ongoing research and development with field expertise in the manufacture of AC power line filters. Tycor products are marketed internationally through distributors.

Tycor filters provide computer grade power for microprocessor-based equipment to ensure reliable and efficient performance. Typical applications include: computers, CAD/CAM and robotics, point-of-sale terminals, programmable logic controllers, medical and military equipment.

The firm's engineering research and development department continuously tests and upgrades products to ensure they meet and exceed military and industry specifications and are compatible with all equipment loads.

U

UMATAC Industrial Processes
A Division of UMA Engineering Ltd.
210, 2880 Glenmore Trail
Calgary, Alberta
T2C 2E7
(403) 279-8080 ⬛

UMATAC specializes in research and development related to the Taciuk

Processor, a new method of processing heavy oil sands. The Alberta Oil Sands Technology and Research Authority has contributed $15 million to development of this processor over the past 12 years. The Taciuk Processor differs from hot water and other conventional extraction processes in that it accepts as-mined oil sand, processing it simultaneously to recover and thermally upgrade hydrocarbons, thus eliminating a number of treatment aspects such as the need for water and waste tailings ponds.

Major tests of the processor have been made on Malagasy oil sand feed stocks. It has also been tested successfully on oil shales from Australia and the United States. Specialized applications of this technology, for treatment of hydrocarbon-contaminated spills and waste effluents, have been tested successfully and environmental analyses indicated the effluents can be made acceptable for final disposal and by-product oil recycled through existing refineries. A $100-million demonstration project is planned.

V

Valmet-Sentrol Limited
1, 6325 - 12 Street S.E.
Calgary, Alberta
T2H 2K1
(403) 253-8848 🟪

One of the largest Canadian suppliers of computer-based Supervisory Control and Data Acquisition (SCADA) systems to pipelines, Sentrol devotes product research and development at its Calgary facilities to the development of hardware, software and electronics products relating to the oil, gas and water pipeline industries. The firm also markets these products directly on a worldwide basis.

In 1986 the Calgary facilities of Sentrol were expanded to accommodate growth in sales of SCADA systems and to allow more room for system training, demonstration and integration of new manufacturing facilities. In 1987, the company expanded into the U.S. market by acquiring a SCADA operation in New Orleans, Louisiana. The new U.S. operations will be better able to serve the needs of U.S. customers in the oil, gas, water and wastewater industries.

VenTech Healthcare Inc.
Suite 1500, Canada Life Tower
735 - 6 Avenue S.W.
Calgary, Alberta
T2P 3T7
(403) 233-2244 🟥

An increasingly dominant force in the Canadian healthcare products industry, VenTech Healthcare Inc., through a series of acquisitions, has amalgamated traditional and high technology medical tools into a single integrated product line. The group includes companies specializing in the manufacture and distribution of medical and home health care products in U.S. and Canadian markets, and has strong capability in new product development.

Primary manufacturing and R&D facilities in Calgary, including a new microbiology laboratory focus on two of the fastest-growing medical product areas in North America — disposables and microbiologicals. The firm's microbiological systems, known as MIC/ID panels, are used to identify infectious microorganisms in order to assess their susceptibility to various dosages of antibiotics.

Sales from Canadian sources are an estimated $40 million annually.

W

Western Co-operative Fertilizers Limited
Box 2500
Calgary, Alberta
T2P 2N1
(403) 279-1212 🟥

Western Co-operative Fertilizers Limited manufactures fertilizer for retailing by Western Canadian farmer owned co-operatives. The company has maintained an active field research program for the past 20 years to demonstrate the value of fertilizer and to develop practical and more efficient alternatives for fertilizer application.

Western Co-operative funds some university based research and has participated in a number of joint industry/ government research projects.

Western Geophysical Company of Canada, Ltd.
2612 - 37 Avenue N.E.
Calgary, Alberta
T1Y 5L2
(403) 291-8100 🟦

Considered a leader in the field of advanced seismic techniques and processing, Western Geophysical Company of Canada, Ltd., has developed expertise in high resolution 3-D seismic surveying for both exploration and production applications. Established in 1952, the firm employs an average of 250 people and has a strong research focus.

Western Geophysical is currently involved in a joint research venture with the Alberta Research Council to develop technology designed to improve the success rate and economic viability of miscible oil recovery. By combining their geophysical, geological and engineering expertise, the researchers, using CAT Scan equipment and techniques normally employed to visualize the human brain, are tracking the course of fluids pumped into older petroleum reservoirs during enhanced recovery. Success of the project is seen as improving opportunities for Alberta's substantial geophysical industry.

Western Research
Division of Bow Valley Resource
Services Ltd.
1313 - 44 Avenue N.E.
Calgary, Alberta
T2E 6L5
(403) 291-1313 🟦 🟩

Western Research is internationally recognized for its pioneering role in the development of sulphur species analyzers. These ultra-violet photometic analyzers are the heart of process controllers, product stream quality control systems and emission monitoring systems used primarily in sour gas plants and refineries. Most recently, a total reduced sulphur gas analyzer has been developed for the pulp and paper industry.

As a leader in sulphur recovery technology, Western Research has conducted a successful seminar program on the sulphur recovery process for more than a decade. Western's sulphur plant research and experience is also captured in SULSIM®, a P.C.-based sulphur recovery plant simulator.

In addition to specialized products and services related to sulphur, Western Research provides environmental engineering and meteorological consulting, source testing, ambient air monitoring, waste gas incinerators, and hazardous waste management and analytical services.

Westronic Inc.
4525 Manilla Road S.E.
Calgary, Alberta
T2G 4B6
(403) 243-3335 🟪

Westronic Inc. specializes in Supervisory Control and Data Acquisition (SCADA) Remote Terminal Units (RTUs). Major focus is on development of remote control and data acquisition products for the oil and gas, telecommunications and electric utility industries, particularly microcomputer-based RTUs for energy management and control.

The company designed and developed the WESDAC line of software and hardware, one of the products it markets in Canada, the United States and overseas. Exports account for 75 per cent of Westronic's business.

Willowglen Systems Ltd.
1, 1235 - 64 Avenue S.E.
Calgary, Alberta
T2H 2J7
(403) 253-3051 🟪

Since its founding in 1974, Willowglen Systems has proven its expertise in a wide variety of applications of SCADA (Supervisory Control and Data Acquisition) systems. Unique in that it is the only international company specializing totally in the design, engineering and supply of SCADA systems, the firm supplies products for its own systems and for major industrial products engineered by others.

Willowglen systems are in use by the electric power, oil and gas, water, transportation, telecommunications, and security and energy management industries worldwide. Recent international contracts have called for the supply of an automation system to the Metropolitan Water District of Southern California, a control and monitoring system for 3,000 Singapore highrises, and automation for a Soviet oilfield.

Research and development focuses on a new generation of SCADA systems and on the potential for spin-off products in other markets.

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The time is now. The opportunities are unlimited. For more information on opportunities in TECHciting Alberta, contact:

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